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## Addresses.

### THE PLACE OF THE HOME, THE DISPENSARY, THE SANATORIUM OR HOSPITAL IN THE TREATMENT OF TUBERCULOSIS (VALUE OF DIET, REST, FRESH AIR, ETC.).*


BY EDWARD O. OTIS, M.D., BOSTON,

*Professor of Pulmonary Diseases and Climatology, Tufts College Medical School.*


ONE can, in the first place, make various divisions of tuberculous individuals with regard to treatment.

*First.* There are those who receive no treatment at all; and of these there are some who never know that they have tuberculosis, and recover with no direct treatment. They suffer for a while from a moderate depression of health included under the generic term of "run down." They reorganize more or less their routine of life, take a vacation, pay more attention to rest and food, and in a short time their resistance recovers its normal power, and their usual health returns. There are others in a more or less advanced stage, who have no acute symptoms, maintain an equilibrium between the infection and the resistance, and live on indefinitely, attending to their occupation with more or less regularity. They may or may not have been under treatment in a sanatorium or elsewhere; they know they have tuberculosis, for they cough and expectorate, but so long as their general health remains fairly good and no acute symptoms occur they go on their way and attend to their duties regardless of their disease. They are probably more or less of a menace to their community, but it is apparently one of the unavoidable risks incident to civilization.

*Second.* We can make the general division of those who are treated for their disease, between those who receive treatment at home or in an open health resort,—which includes the majority,—and those who go to some institution for treatment; and of those who are treated at home we can make a further distinction between those who receive treatment from a dispensary and those who are treated solely by their family physician.

All treatment must be based upon the same fundamental principles, whether at home or in a sanatorium, namely, what we all know as the "hygienic-dietetic" or "open air" treatment, and ideally this treatment should be most successfully carried out in a properly equipped and conducted sanatorium, but there are often personal or other considerations which render the home treatment the only one, and indeed the most satisfactory. Of course it is understood

* An address before the Framingham Medical Club and the Community Health Station, January 3, 1918.

that in speaking of treatment here I am referring to such cases as offer a reasonable, or at least some chance of arrest or improvement, and it is difficult to determine at the outset what these cases are. Some very unpromising cases, as we all know, make remarkable recoveries, even when well advanced. For the obviously incurable, far-advanced cases the "open-air cure" is not applicable. Such need only comfortable care while they drag out their weary days, either in a consumptive hospital or at home. Infinitely pathetic is the slow and steady march to the grave of the advanced consumptive, and one cannot be too patient and tender with such unfortunate ones.

Furthermore, in speaking of tuberculosis in relation to treatment, I am, of course, referring to *clinical* tuberculosis, which has symptoms of toxemia, such as fever, tachycardia, cough, loss of weight and strength, etc., not of *anatomical* tuberculosis, so called, in which the physical examination indicates some tuberculous infiltration, but without activity as indicated by symptoms. The individual is in no way ill, and consequently needs no treatment. Probably most of us are more or less in this latter category. As I have said above, a large number of active tuberculous persons must be treated at their homes if treated at all; for, in the first place, there are not sanatorium accommodations for but a minority, and in the second place, many will not or cannot go to an institution, for various reasons. Moreover, home treatment, if conducted by a conscientious and painstaking physician, with the coöperation of the patient, will, in many cases at least, produce quite as good results as sanatorium treatment, and sometimes better.

The present-day treatment of tuberculosis is essentially hygienic,—rest, diet, fresh air, and the prompt correction of any complications are the four basic elements. What is almost equally important, but not always sufficiently appreciated, is the psychological element in the treatment, and herein is the preëminent value of the inspiring physician, whether in the sanatorium or in home treatment; hope, faith, courage, peace of mind, are most essential for a successful conduct of the treatment, and the true tuberculosis physician must inspire his patients with these virtues. The late Doctors Trudeau of Saranac and King of the Loomis Sanatorium were striking examples of this kind of a physician.

To treat a case successfully at home requires a careful and painstaking arrangement of all the details by the physician. He must arrange the diet, make out the menu, assure himself that the proper amount of food is taken; arrange the room for sleeping or, better, a sleeping-porch, which can often be inexpensively done. If there is an afternoon temperature, he must keep the patient at rest and, when possible, have a nurse, as with other bed patients. Later, when the time for exercise has come, he must carefully arrange and supervise that, both as to the kind and amount. The physician must, so to speak, hold a weekly or periodic class with his patient and go over the previous period's record, and hence a record of the pulse, temperature, rest, amount of food taken, time spent in the open air, and whatever other details the physician may desire should be kept by the patient, nurse or attendant. Of course, the proper disposal of the sputum must be insisted upon and the patient instructed as to safe coughing. The other members of the household must be instructed as to their duty towards the patient, and given an intelligent understanding of the situation. All the members of the household should be examined, for they are "contacts." With an enthusiastic, painstaking physician, who possesses the confidence of his patient, and who is willing to devote the time for a proper and complete management of the case, and with the intelligent coöperation of the patient and other members of the household, I believe a case of tuberculosis can be perfectly well treated at home, as I have before said.

*The Dispensary.* The principal rôle of the dispensary is in making the diagnosis and arranging for the treatment of the tuberculous patient, either by his own physician at home, or in a sanatorium or hospital. I do not believe that it is the province of the dispensary to treat its tuberculous patients, nor can it satisfactorily do so. If, however, it does assume treatment, as it sometimes seems compelled to do, it must proceed upon much the same plan as I have outlined for the private physician. The home of the patient should be visited by the dispensary physician or visiting nurse, proper arrangements devised for fresh air both day and night, the diet arranged, and, in brief, all the details of the treatment. At least once a week the patient, if an ambulatory case, should report at the dispensary for a review of the previous week, and to receive whatever new instructions

are necessary. In fact, the dispensary, when it does attempt treatment, must proceed upon much the same plan as the well-known "Class Method" so successfully developed by Dr. Pratt.

*The Sanatorium.* The sanatorium is only a large home, so to speak, especially designed and equipped for the special purpose of treating this single disease with medical service trained in tuberculosis work. The same general plan of treatment is followed as I have outlined for the home,—fresh air, proper and abundant food, rest—complete in fever cases—and supervised exercise, when the time for exercise comes. There are, however, certain obvious advantages which the sanatorium possesses which do not or may not exist in the home treatment:

*First.* The sanatorium is established in a supposedly favorable location as to climate, situation, protection from wind, etc. If a state sanatorium, it is situated in the best available location in the state in regard to climate, purity of air, etc.

*Second.* A skilled physician is always at hand for any emergency, such as hemorrhage or any sudden complication.

*Third.* When a dietitian is employed, as is the case in most large sanatoria, the diet as to food values can be arranged more scientifically.

*Fourth.* Certain specific forms of treatment, as the use of tuberculin or the employment of artificial pneumothorax, can only, or best, be carried out in an institution where physicians are experienced in these methods of treatment.

*Fifth.* Better discipline can often be maintained, especially with certain patients of weak will-power, and lapses from the rigidity of the routine treatment are avoided. Indeed, with a patient of little self-control the sanatorium is the only place which offers any prospect of successful treatment.

*Sixth.* The example of others all doing the same thing—taking the "cure"—makes it easier to follow out the treatment, and encourages one to do so when he sees the benefit of it in others.

With all its advantages, the sanatorium is also not without disadvantages. In the first place, when a large number of patients are treated *en masse* there is, of necessity, a certain rigidity in the treatment. Each patient cannot be individualized as in home treatment, or receive so much personal attention from the sanatorium physician. Again, he may not be able to obtain just the kind of food he has been accustomed to at home, and with certain nationalities this means much. There is also a monotony of diets, which tends to loss of appetite. The companionship may not always be agreeable, and, on the other hand, loneliness and homesickness may depress one. In general, there are the annoyances and disadvantages incident to any institutional life, be it in a hospital or sanatorium. Some patients will never do well in a sanatorium, while for others it is the only place which offers a reasonable hope of arrest.

*The Consumptive Hospital.* The consumptive hospital is quite a different institution from the sanatorium. It is, primarily and chiefly, intended for advanced cases, and its principal duty is to afford these poor patients comfortable care while they live. In my opinion no such equipment for open-air life is necessary as in a sanatorium. Warm, well ventilated wards are the essential thing. The consumptive hospital as a permanency is comparable to the reception hospital in connection with a sanatorium where patients are temporarily placed for observation or for the treatment of acute symptoms. Even though advanced and apparently hopeless. some cases will so far regain their resistance as to be enabled to lead a comfortable existence and do a certain amount of work. Some will even achieve a genuine arrest, with a large amount of fibrosis, to be sure, which will prevent any strenuous exertion but which will allow a limited activity. There are at present many examples of the consumptive hospital in this state, as all cities above a certain number of inhabitants are obliged by law to provide them. In Europe the general hospitals admit such cases. The poor, advanced consumptive has almost infinite troubles and distresses of one kind or another, and needs all the care and sympathy we can give him, for his condition is a lamentable one indeed. He is often the most grateful of patients, though sometimes he is also ths most incessant and imperative in his demands. In brief, the main treatment in a consumptive hospital for advanced, hopeless cases is everything and anything which will make the patient comfortable and mitigate his sufferings and weariness.

*Diet, Rest, Fresh Air, Exercise.* As has been said above, the basic principles of treatment are the same whether at home or in a sanatorium, and to repeat, they are, first, a painstaking and constant supervision by the physician, who should arrange all the details of the

new life of the patient. "A masterful arrangement on the part of the doctor," as Osler puts it. Diet, rest, sunshine and fresh air, and exercise when permissible. When treated at home it is well to have the patient keep a daily record of his temperature and such other details as the physician may desire. As to diet, if the digestion is normal, three good meals a day of a mixed diet, with an added amount of fat and carbohydrates if the patient is below weight, as he generally is, will suffice. I insist upon a liberal amount of bread and butter and a glass of milk with every meal. If the patient cannot take the three ample meals, lunches between meals are to be added to make up the deficiency, such as milk and eggs, broth, cocoa, or anything nutritious that he can be persuaded to take. In many cases the physician will have to arrange the daily menu in order to be certain that his patient gets the right kind and amount of nourishing food. "My kitchen is my pharmacy," is the oft-quoted saying of Dettweiler. In general, the average tuberculous patient needs from 500 to 700 calories of proteids, 1200 to 1500 calories of carbohydrates, and 1300 to 1500 calories of fats. Very admirable charts have been prepared by the United States Department of Agriculture, indicating pictorially the food values of the different articles of diet, so that one can see at a glance the amount of proteids, carbohydrates and fats any article of food contains, from a banana to a herring. If digestive disturbances exist these must receive proper attention, and the diet modified in such a way as can be digested and assimilated. One must ever bear in mind that "a consumptive who does not eat is doomed," and that his stomach is one of the toughest organs in his body. If the physician does not go to the extent of arranging the daily menu he can give a list of nutritious and proper foods from which to make a selection.

*Rest.* During the whole course of the treatment rest must hold a predominant place. If there is fever, an afternoon temperature above 99.5°, the rest is to be absolute as in any other active infection, and when possible this rest should be in the open air, as in a sleeping porch. If there is no rise of temperature, there should still be rest a considerable portion of the day, but not bed rest, and the night's sleep should be long. Dr. Pratt is the energetic exponent of complete rest throughout the whole course of the treatment. Few, however, I think, are disposed to go as far as that, but would rather agree with Dr. Baldwin in his admirable statement of the great principles of treatment in his recent address before this Club, namely, "*regulated exercise* during convalescence or quiescence of the disease." If the patient is kept at rest during the long months, or it may be years, of his treatment, his morale may become so enfeebled that he may never dare to resume his place as an active member of the community again. He may effect his cure, but in doing so he has destroyed his usefulness. Those of us who see much of tuberculosis are familiar with such unfortunate cases. At the commencement of the treatment, even if there is no fever, it is a wise rule to keep the patient at absolute rest for two weeks; for in this way, the physician can get a better idea of the resistance and recuperative powers of his patient. One can never do harm by insisting upon much rest, and when in doubt it is safest to prescribe rest. Before the treatment of tuberculosis had become so standardized as it is now, the significance of rest in the active stage of the disease, when there was fever, was not fully appreciated, strange as it may seem, for in other acute infections it was recognized that complete rest was the foundation of all treatment. Undoubtedly, in consequence, many lost their chance of recovery by exercising while there was fever, and at the present time it is to be feared that not all physicians fully realize the supreme importance of "rest when fever"—*absolute rest.*

*Fresh Air.* If possible, a sleeping porch or the protected corner of a piazza should be arranged for outdoor sleeping, although a large, airy room with several windows, and which has had the sunshine during the day, is, in many cases, a satisfactory substitute. With a little ingenuity on the part of the physician, an inexpensive sleeping porch can generally be devised. The National Association for the Study and Prevention of Tuberculosis has issued a little pamphlet illustrating many simple appliances for outdoor sleeping. It is noteworthy how readily most persons adapt themselves to outdoor sleeping, if properly protected and their feet are warm, for one cannot sleep with cold feet. There must be protection from the wind, and if the patient is awakened early by the morning light, a band or a long stocking can be tied over the eyes. Of bed clothes, the best plan is to have a good part of them upon the patient himself, in the form of woolen underclothes, thick pajamas, woolen stockings, a knit

helmet for the head. Newspapers placed under the mattress will shut out the wind from below. When one has once become accustomed to outdoor sleeping he is never quite satisfied to sleep indoors again, for he finds the open-air sleep so much more refreshing. One should, however, dress and undress in a warm room.

*Exercise.* This subject has already been referred to, but it is of such vital importance to have a clear understanding of it that repetition will not be amiss. No exercise while there is fever. When, however, fever has disappeared and all the symptoms are improving, the weight and strength increasing, cough and expectoration diminishing, carefully regulated exercise may be begun, and if there is no reaction it can gradually be increased. If, on the contrary, there is evidence of a reaction after the exercise, as indicated by a rise of temperature a half hour or an hour later, with headache and a general feeling of malaise, the exercise must be omitted for a few days or lessened.

It is of extreme importance that the exercise should be carefully prescribed, both as to kind and time, and constantly supervised; for example, so many holes of golf, so long a walk, so much garden work, and with so much expenditure of energy, and for a definite period of time. is the careful plan and regulation of exercise pursued at the Loomis Sanatorium. Reference has already been made to the Pratt method, of no exercise during the whole course of the treatment. Dettweiler of Falkenstein also introduced this plan of continuous rest. The results, it must be confessed, are excellent, but, nevertheless, I am of the opinion that regulated exercise at the proper period of the treatment, when all the symptoms are improving, produces equally good results, and, moreover, prepares the patient to resume his work when the arrest is accomplished. As to gymnastic and breathing exercises, advocated by some, I do not believe they are usually advisable or are of any especial value, and they may do harm. All violent exercise, such as a violent game of tennis, should, of course, be avoided. It is well to remember that more patients injure themselves by too much exercise than by too little. It is a very inadequate comprehension of the subject of exercise for the tuberculous individual, to say, "Take a little exercise"; the kind, the amount, and the time should all be carefully prescribed.

*The Cold Bath.* The cold morning bath is good for some patients and bad for others and should, therefore, not be ordered indiscriminately. If the patient is fairly robust and has a good resistance, the cold bath will act as a tonic, and is a useful adjunct to the treatment. If, on the contrary, the patient is slow to react, feels chilly for some time after the bath, and has a feeling of depression rather than of invigoration, the bath should either be omitted or gradually begun, first with warm water or dry rubbing, and then with the wet pack or cooler water until a temperature of 60° F. can be endured without discomfort or lack of prompt reaction. There are many simple methods of taking the cold bath; all that is actually necessary is a washcloth or large sponge, a bowl of water to which a little sea salt may be added, and a coarse towel. If, for any reason, the cold bath is not considered applicable for the whole body, it can be applied to the neck and chest.

*Clothing.* No more clothing should be worn than is sufficient for comfort. Generally the tuberculous patient will require rather more warm clothing than the normal person, but an excessive amount, especially about the chest, is unnecessary and debilitating. It is a popular belief, or was, that the consumptive must be heavily clothed, and one often meets with examples of this erroneous idea. Increased bodily production of heat by increased bodily energy is the essential means of keeping comfortably warm, not by excessive clothing. For outdoor life, a pair of arctics, with thick woolen stockings and a fur- or woolen-lined overcoat, or one of leather, will render one comfortable in cold weather. One can dress in the same way and sit by an open window when, for any reason, he cannot be out of doors.

It will be seen from this hasty review of the treatment of curable cases of tuberculosis that the fundamental principles of treatment are few and simple, but their successful application requires careful, painstaking, and constant attention to the many details involved, and an individualization of each patient.

The descent to active tuberculosis is a slow and insidious one, and the ascent to health again is often equally slow, and demands patience and fortitude on the part of the patient, and unremitting care on the part of the physician.

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Bowdoin Medical School Graduation.—Report from Portland, Me., states that the annual graduation exercises of a class of 18 were held at the Bowdoin Medical School on March 2—three months in advance of the usual time.

# SOME MODERN MEDICAL PROBLEMS.*

BY TIMOTHY LEARY, M.D., BOSTON.

THE War Lord, using Christianity as a shield, while invoking the Pagan gods, has let loose upon the world a war which has wiped out at one stroke the progress of centuries of civilization. Pursuant to the Pagan practices, millions of human beings have been subjected to violence and death, international law is made a subject for mockery, treaties have become scraps of paper, deceit and rapine and the slavery and slaughter of innocents have replaced the Christian standards. We have reverted to the primitive conditions of the Pagan period.

How great this reversion has been is illustrated by the old but new medical problems of the present war.

The war is being fought underground on the Western front, in the most fertile terrain of Europe. This garden of the world owed its fruitfulness to high fertilization with manure, and to the moisture of the climate. The trenches in which fighting is being carried on, dug through this rich ground, are converted into veritable sewers by the continuous rainfall.

We were proud of the fact that advances in bacteriology had made the world clean, surgically, even in war. The conditions of trench warfare have reversed this picture, and we are carried back to the days of Ambroise Paré or beyond. Clean wounds are the exception, and not the rule. The bacteriology of the wounds is actually that of sewage. Instead of clean-cut rifle wounds, lacerated and contused wounds, due to shrapnel or that weapon of the barbaric period, the trench bomb, are most commonly met with. The driving of sewage-soaked clothing into the wounds, by fragments of shrapnel and bomb casing, results in a high percentage of infections with the gas bacillus, derived, perhaps, from the putrefying bodies of the unburied dead.

The fire pots and winged fire of the ancients have again come into use and the stink-pots are represented by deadly gases, which cauterize the mucous membranes as with a flame. The use of high explosive shells has resulted in a new phenomenon,—shell shock,—visited often on those so remote from the bursting shell that external injuries are slight, if any; marked in fatal cases by minute hemorrhages into the brain, and in the living, by manifestations, perhaps partly neurasthenic or hysterical, of minds literally shaken from their foundations.

Another new but old lesion is the so-called trench foot. Thought in the beginning of the war to be due to freezing of the feet, it is now agreed to be a neuro-vascular phenomenon, favored by varicosities or other disturbances of the circulation, and due to the long exposure, in tight boots, without ventilation, in the water of the trenches. It is interesting to note that Larrey, Napoleon's great surgeon, recognized during the Napoleonic wars that this phenomenon did not arise during periods of freezing, but appeared after the exposure of men to continuous wet and cold, when opportunity for change of footwear did not present.

The necessarily intimate association of human beings in masses in the trenches and dugouts, with infrequent opportunity for bathing or change of clothing, has given rise to universal infestation with that too familiar friend of mankind,—the body louse, or the "cootie" of trench slang. The cootie is the carrier of typhus fever, which the allied forces have largely escaped, not because of the absence of lice, but because the troops as a whole come from countries where typhus has largely disappeared with the louse, as a result of the practice of personal cleanliness. On the Eastern and Southern fronts, louse transfer has been followed by epidemics of typhus, originating in the endemic centers of the disease, the lands of the annual bath,—Serbia, Bulgaria, Russia and Turkey.

Another pest of the underworld, the rat, is able to flourish under trench conditions. This animal with other rodents, such as the field vole, is a carrier of a group of spirochetae, which recent observations in Japan, where from the nature of the habitations rat infestation is common, have shown to be the pathogenic agents producing rat-bite fever and infectious jaundice. The obscure trench fevers and trench nephritis are accompanied by the presence of spirochetae resembling those found in rodents, and it is probable that these rat parasites, transmitted either by biting, or by the contamination of food with rat excreta, are causal agents of these diseases.

These problems are not new, except to our civilization. We are afflicted with the plagues of the cave dwellers.

The truly newer problems we have met and

* Address delivered to the Graduating Class of the Tufts College Medical School Feb. 6, 1918.

are solving. Though religion has faltered and justice has failed; though our boasted efficiency has miscarried, there is one service in every army which has met all requirements, and has had no explanations or apologies to offer.

President Eliot said, in May, 1917:

"In the present crisis in the life of the American people, the medical profession cannot but rejoice that it was better prepared for war service than any other profession in the country, including the military and naval profession. It was prepared to apply every medical and surgical invention of the last fifty years at once for the benefit of the Army and Navy. It did apply inoculation for typhoid, and conducted a successful resistance to typhus. It was already preventing yellow fever, and curing and preventing hookworm disease and malaria. It promptly demonstrated that surgery was something more than cutting off and cutting out—it could rectify and repair. It could make immediate application in war of the recently discovered improvements in orthopedic and dental surgery. The first aid which America was able to give to the European combatants was medical aid. This country is not ready yet to give effective military or naval aid; but we were ready to send in the first year of the war doctors, surgeons, nurses and orderlies by the thousand, thoroughly prepared to render efficient service at the great hospitals at the front or in the rear. In war as in peace, the medical profession has shown itself to be thoroughly altruistic, beneficent and self-sacrificing."

Lloyd George has said:

"When you come to the Medical Service,—the men and the women,—they have never shown greater courage, knowledge and experience. Thousands of them have devoted themselves—devotion is the word—to the curing of the wounded and the healing of the sick. We owe our thanks to the medical profession. They have suffered; hundreds have been killed and many more hundreds wounded."

Earl Curzon, also in moving a vote of thanks to the British forces, made the following statement:

"There has never been an army that has been in such a state of health as the British Army in France. In other wars disease has often proved more fatal than the guns of the enemy. We remember it in the Crimea. There were even some sad stories in South Africa. But in this war the health of the army in the field has actually been better than that of the civilian population at home. It has been better than the health of the army in times of peace, and, paradoxical as it may seem, the British Army in France has really been a sanitarium for the British citizen."

Our own experience is similar. Though much publicity has been given to inadequate camp and hospital conditions, due to deficiencies of the quartermaster service, the fact remains that the mortality from disease among our troops is but a fraction of the mortality among our civilian population. The principal menaces to health have been epidemics of pneumonia, meningitis, and measles. The first two, which furnish a considerable mortality record, will be controlled, I venture to prophesy, by prophylactic vaccination.

All of you who are physically fit will go automatically into the service of your country. It will be your duty, as a part of the great medical services, to deal with the problems for which civil life has prepared you, and with the new old problems which I have cited, and others which may arise.

Your duties will not end there. It is the glorious function of your profession to serve as the great salvage corps, for the restoring to humanity of the derelict fragments of human beings, whom war has crippled in body or mind, but not destroyed. The crippled veteran of previous wars has been permitted to drag out an existence, unhappy though pensioned, a salaried pauper, dependent on the charity of the community and serving no useful purpose. The crippled veteran of this war will, as the result of organized effort for his reconstruction and rehabilitation, be given every opportunity to prepare himself for work adapted to his physical disability, and so will be able to serve some useful purpose in civil life. In other words, he will be given back not only his body, but his independence of mind and soul, as far as is possible.

On your return at the end of the war, with added experience and ripened wisdom, with an outlook broadened and chastened by contact with suffering humanity, you will have several options offered you.

Those of you who are adventurous may have a hand in the spreading of civilization to new lands. The world has so shrunk that the conquest of the savage and uninhabited portions of the globe has become a purely medical problem. The civilization of the Congo and Eastern, Western and Central Africa, of the wilds of South America, in a word, of the unredeemed

portions of the world's surface, is no longer a question of men, or money, or transportation or hostile tribes, but of disease, which paralyzes the forces of the white man.

The insuperable difficulties which met the French effort to build the Panama Canal, were not due to lack of engineering skill, nor of money to carry out the enterprise, but arose because the workers were killed off by disease faster than their successors could be supplied. This, the principal obstacle to success, was overcome by the destruction of the insect carriers of disease, according to methods whose efficacy was demonstrated by Gorgas, following the discoveries of Reed, Carroll, Lazear and Agramonte,—methods which have made the harbors of Cuba, the Spanish Main, Brazil, and the Western Tropics safe ports of call at all seasons, for the first time in their history. The Panama Canal is a monument to the efficiency of medical research.

If you should choose a life of adventure in the advancing of civilization in the wilds, you may be called upon to walk alone and unafraid into the valley of the shadow of death; to exhibit a form of courage which men with other training rarely show. As an example in point, immediately following the Spanish-American War, the city of Santiago was garrisoned by the men who fought at Caney. No man who has looked upon that naked sugarloaf, crowned with its blockhouse, can for a moment doubt the courage of the troops who stormed and took it. And yet, when yellow fever appeared in the city, the withdrawal of these troops took on the nature of a flight, and faces blanched with fear were in evidence. These men had shown their bravery in the face of Spanish bullets—but bullets are tangible things. This unseen death, creeping in the dark upon its victims, caused by an agent which human eye cannot see, even with the aid of the microscope, converting human beings into loathsome objects to be isolated from their kind and, if death comes, to be thrust hastily into the ground, without the pomp and panoply of war, might well give them pause. To charge into a storm of bullets, with Hotspur enthusiasm for the fray, and the shouts of comrades in one's ears, is one thing, but to face alone in cold blood the unseen death, is another.

It is the duty of your profession to meet and solve these problems, and thus make safe the unreclaimed portions of the world for the white man and his civilization.

Another choice which will be offered you for your life work is entrance into one of the public services. The Army, the Navy and the Public Health Services of the National Government, even before the war, had grown with our expansion into a world power. To the credit of the Army Medical Corps is to be placed the solution of the yellow fever problem, the recognition of hookworm disease as the cause of tropical anemia, and the first adequate demonstration of the control of typhoid infection by prophylactic vaccination. The Medical Corps of the Navy has advanced our knowledge of tropical diseases, and has demonstrated the value of prophylaxis in the checking of venereal infection. The Public Health Service has added to our information on anaphylaxis, the etiology of measles, the eradication of vermin, and the control of bubonic plague and cholera. This service is the watchdog of our ports, obtaining first-hand knowledge of the plagues which beset foreign countries, and guarding our shores from their invasion. It meets and administers internal problems arising from infection, where the local health authorities are imperfectly equipped, or where the country at large is placed in jeopardy from a new or unusual danger. The Public Health Service has worked with the Rockefeller Foundation in curbing the spread of hookworm disease.

We are slowly realizing that the child—our chief asset—can be converted into a liability or its value as an asset increased, depending upon the care which we are willing or able to expend upon it. In older civilizations, and in our own until a recent period, the welfare of the child was a responsibility of the family alone. The socialization of education led to the disclosure that efforts to develop a mind were seriously handicapped unless that mind occupied a body which was healthy. Nowhere has the influence of bodily state on the mind been more clearly demonstrated than in our Southern country, where the offspring of an intelligent, adventurous race have been converted into feeble-bodied and feeble-minded paupers, "poor white trash," by the ravages of the hookworm.

The arousing of legislators to the necessity of caring for such problems is slow, because legislatures reflect the attitude of the public. The training of the public to think nationally, or, better, socially, instead of selfishly or parochially, is a long and weary task. The pioneer thinkers, whose training in medicine brings

home to them first the national or international character of these problems and their solution, are able more readily to awaken the minds of the few to the necessities of the situation. As a result, there have arisen a series of quasi-public foundations, supported by private funds, which have taken up for the time the burdens which ultimately the public must bear. The bronze doors of the Forsyth Infirmary for Children symbolize the evolution we are undergoing. One door, illustrating primitive motherhood, is titled, "The Mother, Giver of Life and Love"; the other, expressing the modern concept of our responsibilities, is inscribed, "The Commonweal, Giver of Health and Learning."

The lesson we are here to teach is that the care of the public health is a public function, and that many of the disease problems which were thought to be private and personal, or, at most, municipal or territorial, are national or international in their significance. No better example could be supplied than that furnished by hookworm disease in our own lands. Thought at first to be a purely local problem in Porto Rico, investigations have shown that infection with this pest has spread widely throughout our Southern country and the Philippines, and the results of treatment according to the teachings of Ashford, are giving rise to a virtually new birth of a nation.

The prejudices we have inherited from our forebears have led us to adopt an attitude toward certain diseases which is absurd in the light of modern knowledge. We shun and isolate the sufferer from leprosy, a disease which is transmitted only through long and intimate contact, but we allow in many states the man with advanced tuberculosis, who is expectorating billions of tubercle bacilli every day, his complete freedom. Worse than that, we permit the individual infected with syphilis to walk the streets unrestrained, to work in our shops, to eat in our restaurants and to enter our homes. Syphilis is a disease usually lacking the spectacular external manifestations which brand the leper, but due to a parasite so ready for transfer to a new host, and so superficially placed in many of the hidden lesions that mere momentary contact, and indeed indirect contact, by means of a drinking cup, for instance, may suffice to mark a new victim.

The mantle of personal privacy, which has cloaked and favored the spread of this disease, is being lifted by the demands of an enlightened public opinion. It will be a part of your duty to make plain to the world that no man has a right to inflict disease upon his neighbor, knowingly or through ignorance. The public must learn that investigations with reference to the so-called private diseases, and treatment of the individual for the protection of the many, are no more invasions of personal liberty than is the law which prohibits the property owner from building a fire trap, on land which he owns, in the restricted districts of a city. If the lesions of syphilis, or gonorrhea, were as visible on the surface as are those of the leper, there would be no need of debate or instruction in this subject.

Activity in the control of these plagues was never more needed than now, when we are at war. The Wassermann test has shocked us with its revelations of the universal spread of syphilis among our people. But, if German, French and English experiences are a criterion, we may expect a tremendous increase in its prevalence, following the return of our troops. Men who are freed in mass from the restraints and influences of home life are prone to develop the mob spirit, and tend to cast aside the teachings of religion and civilization and even common sense. So that, while we look upon our men as superior to the common lot, while religion and discipline and pride in clean living and self-restraint will serve to save many from exposure, we may expect a large addition to the number of our infected, with the closing of the war.

State and municipal health boards are preparing to assist the profession and the public in the discovery, treatment and continued observation of these cases. So important is the specific treatment of syphilis with the Ehrlich preparation, that the German patent rights have been withdrawn, and it is the purpose of several state health boards, including that of Massachusetts, to manufacture the preparation, and turn it over to the profession at cost, or free of charge, in needy cases.

The broadening of the scope of state and municipal health boards, in both preventive and corrective medicine, has developed the need of men with special training, and opportunities in this respect will open to those of you who will have seen special service in sanitation abroad, or who take added instruction on your return.

In industry in this country in times of peace, there has been a daily toll of injury, disease and death, comparable to the highest records of war.

The old attitude of the employer is illustrated by an experience which I had several years ago. A structural steel workman had missed his footing and gone crashing down, through a building under construction, to his death. He died without relatives or friends. When I called up the large corporation which employed him, and inquired who would care for the burial of the body, I was told, "Let the city bury him." When I replied that I would furnish all of the facts to the newspapers, there was a prompt change in the atmosphere, and the corporation was eager to take up the duty of caring for its dead. Here was a man the nature of whose work required a constant mental and physical alertness during sixty seconds of every minute of his working day. One lapse or one miscalculation by himself or his fellow workmen, and his end might come. So great were the risks he took, that insurance companies would furnish protection only for exorbitant fees. If his injuries had not been fatal he could not have sued successfully for compensation during recovery, because his rights were hedged about with "willing assumption of risk" and "fellow servant" clauses which would effectually have barred him.

We have changed all this. Industries are required by law to assume responsibility, as a proper charge upon the industry, for those who become injured or diseased or who die as the result of their employment.

Employers have come to realize that they have a financial interest in the trained workman, whose protection from accident and disease is as important as the conservation of their other assets. There has developed as a result of this attitude of employers, a new branch of medical activity, having to do with the investigation of the causes of industrial accidents and industrial diseases and their removal.

In connection with the treatment of industrial accidents, public commissions have for the first time been empowered to dictate, by authority of the law, the amount of compensation which shall be paid to physicians for the care of their private patients who have suffered industrial accidents, whether the treatment be carried out in hospitals or in the privacy of the home.

In England, where lodge practice is common, the establishment of old-age pensions and health insurance has been followed by a demand for the socialization of the medical profession, as a public service. Whether the wave of socialism now gathering in Russia and penetrating Germany, will engulf England, as Henderson suggests, is a question, but one of the inevitable results of its success will be the conversion of your profession from its present semi-public position to that of a purely public service.

However, present indications are that when you return from war duty, if you do not enter one of the public services, you will be given opportunity to go into the private practice of medicine. You will be surprised, if you have not during student life observed this peculiar situation, to note the value which the public will place on your services, as measured in dollars and cents.

The spectacular character and the brilliant results of modern surgery, and the prompt improvement of patients following many surgical operations, is followed equally promptly by generous reimbursement of the surgeon by the grateful patient. This is a technical age, and men with technical ability are highly paid. The over-appreciation of the technical has naturally led to a surplus of operators, many of whom are not surgeons in the true sense of the term. The application of efficiency tests to the end-results obtained, as suggested by Codman, should ultimately serve to eliminate the unfit.

Internal medicine, requiring greater basic ability in the man who would be its master than is demanded of men in the more showy branch, pays its devotees less generously than does surgery. The thermometer, the stethoscope, and the test tube are less impressive than the scalpel, and results are usually slow and gradual, in contrast to the sudden relief which frequently follows surgical intervention.

You may be attracted to one of the specialties, in which case you will probably be highly paid. You will pick out some limited field of medicine, after perhaps several years in general practice, and as you narrow your field, the public will evince its appreciation by widening the mouth of its pocketbook.

The surgeon and the specialist are the magnates of the profession. I had in my hands a few days ago a pathetic piece of evidence in this respect. Jenner, the discoverer of vaccination, had printed a circular letter of information to the profession, describing the then new procedure of vaccination. The particular copy which I saw had been sent to Sir Astley Cooper, the most famous fashionable surgeon of his day, whose income is said to have exceeded twenty

thousand pounds per annum. The interesting feature of this copy lay in a postscript over Jenner's signature, in which he apologized for daring to take the valuable time of the great man for the reading of his circular. Time's measure of the relative greatness of the men is indicated by the fact that Cooper's name is not thought of sufficient importance to appear in the Century Dictionary.

Another example of the humility of greatness is found in the story of Metchnikoff, who, while the scientific world watched the struggle for supremacy between his cellular theory and Ehrlich's humoral theory of immunity, the most masterly discussion in modern medical history, received from the Pasteur Institute, I am informed, an annual salary of three thousand francs or six hundred dollars.

The predatory classes, always on the lookout for easy money, have seen an opportunity for gain in the readiness of the public to pay the specialist generously for services. Most of the quack practitioners, therefore, advertise themselves as specialists, and you will see even subdivisions of the specialties, particularly the easy and safe branches dealing wholly with chronic conditions, erected to the dignity of cults, and, backed by abundant funds and lobbies, wringing recognition from legislatures for their so-called schools and so-called degrees.

The neurotics and the neurasthenics, the people who are self-centered to the point where they focus all of their energies on their internal mechanism, to its and their own discomfort; the people who have nothing to do, no external interests, no concern or sympathy for others and no charity,—will go out of your hands into those of the various cults, or will join the Religion of the Selfish, to your financial loss; for the selfish are usually well to do, as was discovered by that astute psychologist, Mary Baker Eddy.

With them, unfortunately, will go a group of sufferers from real diseases, whose diabetes or renal disease, lacking restraints in diet, will rapidly progress; whose tuberculosis will advance from hopeful to hopeless; whose new growth will show the inevitable extension from the operable to the inoperable stage.

You will not be robbed of the poor by the disciples of the various pseudo-medical cults, to whom charity is unknown, and whose methods of treatment(?) are intended to apply only to those who can pay for services rendered.

Most of you will, at least in the beginning, go into the general practice of medicine, the most poorly paid and most highly valued medical service which is offered to the public. General practice is criticized because many general practitioners are content to rest on their laurels, and do not keep pace with the growth of the profession. They serve only as sign-posts for the various specialists. The general practitioner whom the world admires is the man who, in spite of his small income and his long days, finds money for the purchase of medical books and journals, and time to read and digest them; who impresses the specialist, called in for unusual cases, by the accuracy of his observations, the intelligence of his diagnosis, and the up-to-date character of his methods; who is the valued guide, counsellor and friend of a countryside.

That eminent medical publicist, Dr. Richard Cabot, has said that the general practitioner must go. But what is the world to do without him? He is the medical "man in the trenches." He is called to meet at first hand the emergencies of life and death. He it is who makes plain to the amateur graduate of a first-aid course, that a seidlitz powder is a deadly thing to offer to the man whose heart is struggling through an attack of acute insufficiency, masked by symptoms of indigestion. His is the burden of coaxing back to efficient service the recalcitrant organs which are groaning under the emergency load they are carrying. His intimate knowledge of the family affairs makes him appreciate that in saving the wage-earner, he is protecting the family from a life of pauperism, with all that that means.

It is the duty of the profession not to eliminate the general practitioner, but to make more easy his pathway to progress by establishing local or county centers, with laboratory and library facilities in charge of trained medical observers, who will solve his unusual laboratory problems, helping him in searching the literature, and refer him to specialists who are willing to assist when the center authorities are at a loss. According to Professor Winslow's reports, even Russia has progressed further in this direction than we have. The recently established consulting clinic at the Massachusetts General Hospital is a local step in the right direction, but, even with the limited distances to be travelled in our State, is not readily accessible to many of our practitioners. Perhaps travelling consulting clinics, with fixed days of call

at county centers, would overcome the difficulties of the present situation.

Whatever the solution may be, I am loath to believe that the world can dispense with the general practitioner's services, either now or in the future. He is, or should be, the embodiment of all of the qualities which have caused the world to call your profession blessed.

And now, a word of counsel to you, as individuals.

My advice to you in the selection of a location in which to practise, is to pick out the place in which you want to live out your life, and make yourself worthy to deserve the admiration and welcome of your neighbors.

As for your future, to paraphrase Ruskin:

If it is love and an abiding faith in mankind; if it is willingness to subordinate self to the needs of others; if it is realization of the responsibilities you have accepted and purpose to keep yourself ever fit and ready to discharge them worthily, that move you; then the Spirit is upon you, and the world is yours, and the fulness thereof.

It is my high privilege to welcome you to full membership in the medical profession, and to bestow on you the benediction of your Alma Mater. May God bless and speed you in your work.

## Original Articles.

### REVISED IDEAS CONCERNING FOOT DEFECTS AND ORTHOPEDIC FOOTWEAR.

BY HERMAN W. MARSHALL, M.D., BOSTON.

THE last word concerning common foot ailments has not been said yet, although too much to be comprehended readily has been recorded at the present time. There has been a deluge of special information from civil and military orthopedic surgeons, shoemakers and shoe-fitters, each pointing out many important details; but there still remains much to be done in piecing together scattered facts into a simplified, harmonious conception of the entire subject.

Furthermore, certain familiar details increase in significance with time; while other well-known facts lose some of the prominence they held when first brought to notice; and accordingly, there is a need now for sorting over our various and numerous data. The writer, in puzzling over innumerable details of the subject, has picked out special points which he thinks should be emphasized again, although many of them are familiar; and, because of their diversity, they will be presented here to the attention by listing them without trying to elucidate all their complex inter-relationships.

1. *Feet are plastic* and can be moulded gradually into many different forms, especially during earlier years of life, before bones become completely hardened. Illustrations are seen in feet deformed by the old Chinese custom of binding down the toes continuously during the growing period; also in the modern custom of wearing shoes that are too short, with pointed toes and high heels, until feet become contracted, and longitudinal arches are forced abnormally high, while anterior arches become depressed and toes deformed; or thirdly in beneficial regulations of growth by means of plaster casts and strappings in congenitally deformed feet whereby they are restricted in a way that produces more normal shapes as patients grow older.

Bones which have become completely ossified still undergo slow changes; and there is a constant turning over of the lime constituents of bone, some of the lime being eliminated continually, while simultaneously some is being laid down anew. In this way the internal structure of cancellous bone slowly accommodates itself to its shifting mechanical needs. Certain internal trabeculae become thickened and strengthened, others become thinned from absorption, and slight, slow, adaptive changes in bony shapes result from time to time, even in adults.

2. *Foot deformities are produced most commonly by continuous wear of one style of shoes.* Other less common causes include congenital defects, deformities produced by bone diseases and tumors, anterior poliomyelitis and other nervous affections, and various kinds of chronic arthritis.

3. *Results of causes operating previously for prolonged periods are shown by these most common foot deformities;* and the latter should not be interpreted primarily as causes for existing pains or weaknesses complained of; for an extremely large percentage of them are not associated with pain, and such feet are serviceable enough for ordinary requirements of life.

4. *Causes of abnormal weakness, pain, and disability are found most commonly in musculoligamentous weaknesses, strains or irritations.* Other causes for abnormal symptoms include

lesions of bones, joint linings, tendon sheaths, nervous structures and skin.

5. *Sharp distinctions in treatment of foot defects should be made between abnormal symptoms and foot deformities.* Both occur together very frequently, yet there may be marked defects of structure without musculo-ligamentous weakness; or, vice versa, there may be severe pain and weakness with very little deformity. Errors observed in treatment frequently are those of emphasizing unduly the various peculiarities of forms of feet, and overlooking real causes for acute symptoms, namely, those more remote obscure causes for musculo-ligamentous weaknesses and irritations. As a result of these errors, foot symptoms often are unnecessarily prolonged or aggravated by therapeutic procedures.

6. *Feet of persons in good health, who have never worn shoes, are flexible, and adapt themselves easily to innumerable unfavorable conditions,* because the latter states follow one another in rapid succession. All parts of the feet thus are alternately exercised and rested in a physiological manner, while no parts are too badly strained through maintenance of a single permanent position.

7. *Feet of persons in good health* are able to endure without injury, for variable periods of time, shoes that have pointed toes or broad ones, high heels or low ones, flexible shanks or stiff ones, shoes that are a trifle too short or long, or a trifle too wide or narrow for comfort across front parts at locations of transverse arches.

8. *Harm from high heels, pointed toes and shoes fitted too short or too narrow comes only when they are worn too much of the time.* Orthopedic shoes of most approved shape and fit are defective in one important respect, namely, that they tend to fix the feet in one position continuously, to the detriment of certain muscles and ligaments which become thereby weakened through comparative disuse.

9. *Several slightly different styles of shoes with variations in widths and flexibilities are preferable to a single shape and size of the most correct orthopedic last for individual wear,* because slight accommodative changes required in use of several different pairs of shoes of different proportions assist in retention of normal flexibility and adaptability found in barefooted races of people. One of the several styles, however, should be the usual foot-shaped orthopedic shoes.

When this ability of feet to make moderate changes without discomfort is lost, then prompt attention should be given to underlying tendencies that are developing unnoticed toward musculo-ligamentous defects.

10. *Causes of musculo-ligamentous defects* include too much mechanical use of the feet; harmful variations in blood supplying muscles and ligaments; and defective nervous control of these tissues. These three elements are found acting together in each person in normal or defective ways; and the most common defective variation is a combination of too much use with a temporary poor quality of blood.

It is correct to speak of only one defective factor in any selected instance, yet it is still more correct to recognize combined influences at work. For example, a person may fail to develop acute musculo-ligamentous foot strain after an unusual amount of exercise, or after some traumatic cause; but, if the blood becomes poor for any reason at this particular time then the same amount of exercise or an exactly similar injury may produce a strain. One physician, perhaps, will call the trouble a simple mechanical or functional strain. Another physician may point only to the vascular peculiarity, yet a more truthful interpretation includes recognition of both causes acting in combination.

11. *Vascular causes of musculo-ligamentous defects are obscure and numerous.* Some qualities of blood produce musculo-ligamentous weakness and relaxation; others cause muscular rigidity and tenderness; and many vascular peculiarities exert mixed influences so that practically these two extreme types of muscular relaxations or rigidities in a large series of cases show combinations of the two in all intermediate stages.

Furthermore, circulating substances influence bones and synovial linings of joints, as well as muscles and ligaments; and there may be additional confusions arise from adhesions forming in joints and tendon sheaths, or from reflex muscular rigidity due to irritative bacterial foci in the bones.

12. Clinically, musculo-ligamentous weaknesses or irritations, *i.e.*, acute foot strains, are noticed in the following conditions: At times after prolonged illnesses like typhoid fever, scarlet fever, measles, pneumonia, and in connection with infections of tonsils, teeth, naso-pharynx and genito-urinary tract. Cachectic states associated with cancer, anemias, chronic pulmonary

tuberculosis are often accompanied by foot weaknesses and strains. Cardio-renal disease may lead to weakening and stretching of foot muscles and ligaments. Painful foot symptoms are commonly complained of before and after childbirth, due to important vascular and musculo-ligamentous changes going on at these times. Chronic gastro-enteric troubles, constipation, and visceroptosis are remote yet frequent causes of foot symptoms.

13. *The most common vascular origin for mild transient foot symptoms* probably is found in the numerous transient mild auto-intoxications and debilities arising from combinations of overwork, worry, high nervous tension, overeating, and other accompaniments of our modern complex life.

14. *Painful foot symptoms are indicators of underlying, often unrecognized troubles, which may be more serious than the resultant foot disability.* For this reason foot troubles should not be treated locally simply, and all persons who are able should have opinions passed upon their general conditions by physicians who understand relationships which exist between foot defects and patients' general states of health. In this connection, it is well to recall that shoe retailers apparently relieve many cases of foot strain without medical assistance, but often this is because very many of these cases of foot trouble are produced and relieved by self-correcting debilities. At least, all cases which do not subside quickly should have proper medical attention in order to avoid as far as possible the establishing of very chronic resistant types of defects.

15. Practitioners' limitations in care of patients' feet are appreciated by practical shoemen, while many practitioners have still to recognize that there are some shoe retailers and shoe manufacturers whose knowledge of foot troubles locally is very complete. Urged by business competition and other causes, a few have temporarily encroached on the domain of medicine sufficiently to learn structures of feet and how feet maintain their natural shapes and functions. Furthermore, shoemen are familiar with many proportions and foot measurements which most medical men are entirely unaware of.

Their comments, accordingly, on the medical profession are interesting, and an opinion commonly expressed by them is that physicians usually are satisfied if shoes look well, have broad toes, low heels and straight inside lines. Niceties of good fitting, the importance of looseness and snugness, correct balance, the necessity of having a good variety of styles to fit from, completeness in numbers of sizes and widths are points which doctors know too little about; and defects of which are responsible undoubtedly for many unsatisfactory results. The selection of shoe fitters should be made as carefully as selections are made of physicians for treatment of foot troubles.

16. Shoe manufacturers should have the task of furnishing harmoniously graded shapes and sizes of shoes to supply adequately all important needs; but a few of them only have succeeded as yet in constructing series on correct orthopedic principles. Then, secondly, it is essential to have fitters in retail stores who have proper understandings and proper stock to fit from, and these conditions are fulfilled exceptionally rather than usually. Finally, physicians in treating feet have to know how to apply supports, correct general systemic defects, and understand possibilities and limitations of shoe fitting; and in this respect the medical profession still shows a wide range of efficiency, with understanding inadequate not infrequently, it must be admitted.

Since only one important omission or mistake is needed to impair seriously the efficiencies of other steps in ultimate success, there are obvious reasons why so many imperfect results are still obtained. We can be optimistic over the great increase in knowledge, but ought also to be reasonably pessimistic over the chasm which still divides our present grades of efficiency from real perfection.

17. *Deformities are not devoid of significance* although they represent effects of past influences rather than causes of present troubles. They do indicate that feet are working more or less at a mechanical disadvantage although pain is not present; and, while certain muscles and ligaments may strengthen enough to compensate for disadvantages of deformities so that good function still remains possible, yet these structural defects should be corrected as far as practicable, keeping in mind the relative importance of degrees of defection that are being remedied.

18. *Orthopedic corrections of foot deformities* can be as uncomfortable as repeated "breaking in" of shoes in the past which produced these structural defects. And it is unwise to omit the explanations to patients that corrective orthopedic appliances or shoes are not

designed for increased comfort, but for slowly forcing feet back into normal shapes as rapidly as tolerance will permit.

19. *Corrective apparatus should not be forced vigorously with feet that are showing symptoms of acute strain,* because muscles and ligaments then are enduring all they can, and readjustments of corrective nature are liable to be crippling in effect. Instead, strained feet should be comfortably supported with adhesive straps, blood peculiarities attended to; and, finally, when abnormal symptoms have appreciably abated, gentle beginnings made toward slow corrections of pronations, restorations of defective arches and of deflected toes.

When too short shoes, however, are causes of pain, longer shoes should be prescribed immediately, and later, when symptoms have subsided, anterior arches can be forced upward gradually again.

20. *Manipulations, exercises and massage* should not be omitted in the more chronic types of foot troubles, because they are of very great importance if properly done at right stages in restoring normal ranges of joint motions, renewing normal muscle function, and in bringing back the flexibility and elasticity of feet. Details of these measures, however, cannot be discussed in this paper.

21. *New treatments* undoubtedly will be devised in the future and may be essential for special cases; yet the large majority of foot cases are likely to be treated more successfully in the future mainly through wider spread greater efficiencies in use of facilities now at hand. Closer coöperation between shoemen and the medical profession holds possibilities for much greater success.

22. *Special situations,* confusing and apparently contradictory in nature, can be cleared up in many instances only by puzzling over the facts already established, as, for example, employment of a single style of shoes for all men in the United States Army, while on the other hand, multiple styles of footwear are advocated by most progressive shoe dealers.

There are no doubts that feet vary greatly in sizes, shapes and proportions, and that consequently one shape in lasts will not fit all feet in all respects. But, with many widths and lengths a single style can be fitted comfortably and snugly across insteps and anterior arches, while a little extra length does no material harm. This same style of last in its shorter, wider sizes, however, often produces transitory acute foot strain among army recruits who have been previously wearing shoes of various shapes; but their improved personal habits soon help to offset abrupt changes made in their footwear. After a few weeks merely a little extra broadness across toes usually becomes relatively unimportant with robust soldiers, and the only remaining menace of importance is too short shoe lengths. The latter difficulty obviously is not an insuperable one.

Customers in civilian life, on the other hand, require fittings of shoes to existing deformities and to musculo-ligamentous strengths more accurately, partly owing to demands of fashion, and partly because such customers are more likely to be debilitated or in poor physical conditions from various causes. Satisfaction of customers' whims and wishes have to be considered more carefuly than in the Army, where serviceability counts most. Aims of shoe fitters are rather useless accomplishments from an orthopedic point of view when they try to fit all customers absolutely perfectly and comfortably from the very outset; because feet may go from bad to worse regardless of excellent local conditions when underlying vascular causes are not remedied. Feet have adaptability, which is not taken into account in these aims; and shoemen do not appreciate sufficiently the importance of general medical supervision when feet begin to lose their adaptability.

At other times confusion in customers' minds arises because one physician or shoe fitter advises shoes loose across anterior arches, while others recommend shoes with snugly fitted front parts. Both bits of advice may be right, however, for the same individual, and are reconcilable upon understanding that weakened, relaxed feet require additional supports temporarily, while at other times foot ligaments and muscles whose strengths have been restored are better if unsupported. Similar explanations apply to the usefulness and limitations of stiff and flexible shanks. Comparatively few fundamental physiological principles, including the need of alternate periods of rest and exercise, of effects of too much use and disuse, of too much and too little support, of natural adaptability and plasticity of feet, and importance of underlying vascular conditions will account satisfactorily for a multitude of the combinations observed which are individually perplexing.

23. *Surgical treatments for deflected toes* undoubtedly give most satisfactory results in many long-standing cases of severe grade; but it is necessary to sound a note of warning also that a very large number of hallux valgus patients can be equally improved by non-operative methods. As our knowledge of the great possibilities and limitations of surgery has increased, there have been wonderful advances in this special branch of medicine; and very few bad results are observed now after surgical treatments for deflected great toes. This fact, nevertheless, should not be allowed to obscure the comparative merits of other forms of treatment.

While it may be perfectly safe to operate on toe deformities, and almost surely relieve patients to some degree finally, yet the simple expedient of wearing proper shoes with corrective pads and cuffs will relieve the majority of mild cases without surgically damaging the ligaments of transverse arches of feet, and without disabling patients as operations do. Not toe deformities alone, nor possibilities for safe surgery only have to be considered; but functional foot defects which are represented have to be judged mainly, if the highest aim of medical practice, namely, the welfare of patients, is adhered to most strictly.

## DISPENSARIES IN MASSACHUSETTS, PARTICULARLY IN BOSTON.

BY MICHAEL M. DAVIS, JR., PH.D., BOSTON,
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THE Social Insurance Commission of Massachusetts, appointed in 1917, was interested to ascertain the extent to which dispensary service has grown in Boston, and elsewhere in the Commonwealth; the proportion of the population which dispensaries are reaching; the social and economic classes reached; and the kinds of medical service which are provided. The data in this paper were collected at the request of the Commission, and much of the text will appear as an Appendix to its Report.

Dispensaries and out-patient departments of hospitals are generally philanthropic institutions. They usually charge small fees, for instance, twenty-five cents or ten cents per visit, and similar amounts for medicines, etc. These fees are generally remitted in whole or in part when the circumstances of the patient appear to render it necessary.

With the assistance of the State Board of Charity, to which all incorporated charitable institutions must report annually, a list of dispensaries and out-patient departments was secured, and the general statistics of their work ascertained. Table I shows a list of 22 dispensaries and out-patient departments, in Boston, and the total attendance, or number of "visits" made by patients to the clinic, also the number of *new* patients received during the most recent year for which statistics are available. This was usually 1916. The data are not complete, practically all of the tuberculosis dispensaries being omitted. Several small dispensaries are also not included. This renders the figures below rather than above the truth. Since this paper has reference primarily to general medical care, the omission of tuberculosis clinics would not affect conclusions based on these data.

It will be observed that the total annual attendance at these dispensaries was nearly 900,000, and that the number of new patients was over 250,000. To ascertain the number of different individuals we must bear in mind that there are a certain number of persons who are treated at more than one dispensary. Investigations published in *The Modern Hospital* of 1916 (Vol. vii, p. 359) indicate that this overlapping is small, not over 10%, and probably not over 5%. On the other hand, the number of "new patients" at the dispensaries during a year does not equal the number of different individuals during the same period, since many old patients who were treated during a previous year, keep on coming. A total attendance of 895,000 probably represents at least 300,000 different persons. Deducting 10% for overlapping, we have 270,000. Not all of these are from the city of Boston, but the great majority are. Certain of the dispensaries receive patients from Boston only; some, like the Massachusetts General Hospital and the Children's Hospital, receive a considerable proportion from outside the city. Only a few of the annual reports of the institutions state the proportions exactly, but it is very probable that fully three-quarters of the attendance is from within the city limits. Three-quarters of 270,000 is 202,500. It is safe to say that 200,000 residents of Boston receive treatment annually at the dispensaries of the city. This is one-quarter of the total population.

It must not be inferred that this vast number of persons received all of their medical service through these dispensaries. Many of them re-

ceive part of their medical service from a private physician, and come to the dispensaries for special service only. The three departments which correspond more or less to the field covered by the general practitioner are the medical (adult and children's), and the general surgical. At the Out-Patient Department of the Boston City Hospital, 68% of the new patients come to these three clinics, and 32% come to clinics dealing with specialties. At the Massachusetts General Hospital Out-Patient Department, 58½% of the new patients come to the three general clinics, and 41½% to the specialties. At the Boston Dispensary the proportion is reversed, 39% coming to the general and 61% to the special clinics. The average for these three largest institutions is 55% of new patients in the three general clinics, and 45% in the specialties. But a considerable proportion of patients (certainly over 10%, and probably 25%) in the medical, children's and surgical clinics, come to see a specialist. We may say with assurance that more than half of all the patients at dispensaries come to secure service such as requires a specialist rather than a general medical practitioner. In view of the high cost of specialist service at private office rates, this proportion is significant.

There are, in fact, large numbers of families who can and do employ a general practitioner for ordinary ailments, but who cannot afford to pay for the work of an oculist, or a throat specialist or a specialist in the diseases of children, etc. Also, it is a matter of common knowledge to all hospital administrators, that a certain proportion of dispensary patients are referred by doctors, mostly general practitioners, who wish their patients to have specialist service, for which the patient cannot pay.

All the dispensaries on the list aim to reject patients who can afford to pay a private physician for the care they need. The accurate enforcement of this policy is not always easy, for obvious reasons. Investigations have indicated, however, that the proportion of applicants for treatment at the Boston Dispensary and the Out-Patient Department of the Massachusetts General Hospital, who could pay for the medical service which they need, is very small, less than 3%. (See Annual Report, Boston Dispensary, 1915, p. 46.)

From what social classes does this army of 200,000 patients come? The great bulk are wage-earners or their dependents. The family incomes have been tabulated for 1196 families, taken consecutively from the patients in the Boston Dispensary during September, 1917, and 191 families from the Out-Patient Department of the Massachusetts General Hospital, taken during November.* Statistics of income have also been prepared for 1457 individual wage-earners, at the Boston Dispensary, taken during August, 1917. The family incomes, of course, include supplementary earnings of adults or children other than the chief wage-earner. The Massachusetts General Hospital figures agree quite closely with those from the Boston Dispensary, although the number of cases from the Massachusetts General Hospital is rather small on which to base any conclusions.

Taking all these data together, we find that about 40% of the families of these dispensary patients are earning less than $15 a week; about 45% earn between $15 and $20, and 20% to 15% over $20 a week. In other words, a little less than half of these families have an income of $800 or less a year, and about the same number have incomes between $800 and $1000 a year.†

A highly significant figure is the number of cases known to be receiving material aid, *i.e.*, money, food, clothing, fuel, etc., at the time when they were dispensary patients. The proportion of families thus aided by charity was less than 3% among 1196 Boston Dispensary families.‡ It is safe to say that not over 5% of the patients at the dispensaries are usually in receipt of material aid from charitable agencies. In other words, the great bulk of the families whose members are cared for by the dispensaries of Boston are able to meet the ordinary expenses of maintaining a family during health, but they cannot meet the expenses of illness and pay the cost of medical service in addition.

Among the same group of patients of the Massachusetts General Hospital and the Boston Dispensary, it appears that a majority of fam-

* Detailed tables are printed in the Appendix to the Report of the Social Insurance Commission, giving the figures on which these and the following statements are based.

† These estimates of income, based on usual weekly earnings, are probably conservative, as most working people have periods of unemployment which, even during the present prosperous times, would amount to something through the year. The figures, moreover, correspond quite closely to the general levels of wage-earners' incomes, which the reports of our State Bureau of Statistics show to prevail in this community.

‡ Reference is made later to a special intensive study of a number of families, made by the Social Service Departments of the Massachusetts General Hospital, Boston City Hospital, Psychopathic Hospital, and Boston Dispensary, and including 159 cases. It was found that only 49 out of these 159 families, or less than 30%, were in receipt of material aid, although Social Service Department cases are those who present some family problem, or distress other than medical need.

ilies have three children or more; that the proportion of large families is not, however, unduly great; that, in fact, the size and constitution of families is not very different from that which would be found in the community as a whole.

Previous to the war-time régime of abnormally high prices, an income of $800 a year, for a family of average size in Boston, was estimated by several careful students to be barely sufficient for the minimum physical necessities, and gave no margin for the emergency of illness. An income of $1000 a year, for a family of five or six, gave only a very slight margin. Thus, even before the war, families receiving such incomes as these dispensary patients possess, could but just support themselves during health, but could not bear the burden of illness without either deprivation of food or other necessities, or else recourse to charity. At the present time, the above estimates are too low, for wages have, on the average, risen much less than the cost of living. The incomes of these dispensary patients are not lower than are shown by our State Bureau to prevail among many wage-earning groups. They can often pay for medical service in an emergency, but out of an income of $1000 or $1200 a year a family of five or six persons cannot meet the expense of specialist service, nor of any long-continued illness. When the illness is of the chief wage-earner the condition of the family usually becomes serious.

The question has been raised whether, under the present system, the patient frequently delays in getting medical treatment long after the onset of his disease. Data were secured on this point from 1529 patients at the Boston Dispensary and 197 at the Out-Patient Department of the Massachusetts General Hospital—a total of 1726. Out of the 1726, 1236 had had no medical care previous to coming to the clinic, and 435 of these, or 35%, had been suffering from their ailment for three months or more before seeking the clinic's care. One hundred and sixty-three additional cases, or 13% out of the same 1236, had delayed from one to three months. Out of the whole 1726 cases, 350 had waited from a week to a month, while 430 had gone to the clinic within a week from the time they felt their illness.

These figures can be better understood when delay in securing treatment is tabulated in connection with particular diseases. This has been done for 1529 Boston Dispensary cases. Where diseases are such as cause much pain or discomfort in their early stages, such as minor surgical lesions, cuts, burns, etc., or irritations of the skin, treatment appears to be sought pretty promptly. On the other hand, with diseases that cause less trouble to the patient in the beginning, but which are often likely to be more serious, there is frequently more delay. Thus 15 out of 29 patients with tuberculosis were conscious of illness over three months before they sought any kind of treatment, and 7 waited a whole year; 15 out of 37 cases of syphilis waited more than three months, which is past the period when the disease can be most effectively dealt with; 40 out of 69 of disorders of the circulatory system (mostly heart diseases), and 10 out of 21 cases of kidney disease, waited over three months.

Of the minor diseases of the ear, nose, and throat, not requiring operation, 48 out of 75 cases waited less than one month, while out of 152 more serious cases, requiring surgical operation, only 43 cases came within a month, and 98 cases waited over three months. The same contrast appears in "general surgery," since the non-operative and usually minor cases appear to have waited less time before seeing a doctor than the operative cases, which are generally more serious.

The data collected also show the proportion of patients who had some medical care previous to coming to the clinics, and whether this care was secured from a private doctor or from another medical institution (usually a hospital). Three hundred thirty-nine cases (out of 1726) had previously been to a private doctor. The usual reason given for leaving him was that they "had no more money to pay him." A considerable number of cases are referred to the clinics by the doctors, for consultation or for care by a specialist for which the patient could not pay at private rates.

The fact that of these 1726 cases, only 339 had had a private doctor, whereas 435 persons had waited three months or more before getting any medical treatment, suggests that private medical practice is not sought by a large proportion of people because they feel they cannot afford it. It also indicates that there are many persons who either do not know of dispensaries, or who do not wish to accept medical charity. Under the best conditions, people will often delay in going to a doctor, even if a doctor is free. The

figures regarding delayed treatment must be interpreted with this caution in mind.

The Social Service Departments of the four institutions above mentioned rendered reports of 159 cases which had been individually studied. Among the points taken up was the extent of any form of insurance in these families. It was found that sickness insurance was infrequent. Only 23 out of 159 families carried any sickness insurance. One hundred and twenty-four stated that they had none; in 12 cases no data on this point were secured. *Life* insurance was fairly frequent, 60 families carrying some insurance on one or more members, 78 carrying none, and 20 furnishing no information on this matter. This "life insurance" is usually industrial insurance on the weekly-payment plan, providing small amounts on the death of the insured person. The majority of the 60 cases pay 50 cents a week or more for this insurance.

A comparison of the figures secured in this study may be made with the information gathered in California by the Social Insurance Commission of that State in 1916, and published in their Report during the early part of 1917: "Among 2587 patients applying at dispensary clinics in San Francisco, only 53 were dependent upon charity, public or private, for their support" (page 43 of Report). In addition, there were 137 cases of unemployment where dependency was imminent, making a total of 190 cases, or 7%, in which the "application for free treatment at the clinics in San Francisco could be attributed to the fact of dependency or unemployment" (page 44). In 42% of the 2587 San Francisco cases the family income was $14 or under a week, which compares closely with the 36% found among the Boston Dispensary patients, and 43% among the Massachusetts General Hospital cases. The studies in Boston and San Francisco—the two extremes of the continent—are alike in showing that a large number of self-supporting wage-earners of small incomes, not otherwise dependent in any sense, are seeking medical assistance at dispensary clinics. The California Commission accounts for this situation as follows (page 46 of their Report):

"It would be futile to ascribe such seeking (of medical care at the clinics) to a total lack of self-respect and an endeavor to get something for nothing on the part of these individuals. The number of them alone would be sufficient to refute such a conclusion. Aside from this point, however, the interviewing and observation of 1000 cases would convince any one that there is a more far-reaching and direct cause responsible. The growing attendance at the free clinics is accounted for by the fact that they can there get from physicians and surgeons, whom they know to be men and women of reputation, specialist care, which they cannot possibly afford to purchase. There is no reason to suppose that if there were a way by which they might buy this same attention for a small price within their means we should still find the bulk of them frequenting the 'free clinic.'"

In the city of Boston we found that a quarter of the population receive care at dispensary clinics annually. A marked contrast appears between Boston and the remainder of the Commonwealth. From data furnished by the State Board of Charity we find that in Massachusetts, outside of Boston, there are only 30 dispensaries and out-patient departments. The total number of visits paid by patients to these 30 dispensaries and out-patient departments was 138,000 for the last year during which reports were available (usually 1916). The list of institutions is given in Table II. The number of new patients reported was 32,000, and the probable total number of different individuals treated was between 50,000 and 60,000. Boston has one-fifth the population of the Commonwealth, but between three and four times as many dispensary patients as all the other cities and towns in the Commonwealth put together. This is true in spite of the fact that Boston has more physicians in proportion to its population than the rest of the State. The fact that most of the tuberculosis dispensaries are omitted from the lists would not substantially affect the contrast between Boston and the rest of the Commonwealth.

Do these facts mean that Boston is over-supplied with facilities for charitable medical care? Or does it mean that the remainder of the Commonwealth is under-supplied? The statistics gathered do not furnish an answer to this inquiry. There can be little doubt that many communities in Massachusetts contain large numbers of wage-earners whose incomes are no higher than those found among dispensary patients in Boston. The question may at least be raised whether no need exists, in such communities, for some system of organized medical care, particularly in the specialties, such as the dispensaries of the metropolis in a measure provide?

The organizations of dispensaries as found in Boston would, of necessity, have to be adapted to the conditions in smaller communities. In a large city specialists in all the different branches of medicine are usually found, but they are relatively much fewer in smaller places. The large dispensary, particularly if attached to an important hospital, provides medical advantages to the physicians on its staff, by affording facilities for diagnosis and consultation, which a small dispensary cannot offer. Connection with a medical school is also of value to a physician, and is not possible except in a city which has one or more medical colleges. For all these reasons it would be much more difficult and often impossible to secure in small communities anything like the amount of volunteer medical service which is found in the dispensaries of Boston. It may, indeed, be questioned, whether the custom of depending upon volunteer medical service in dispensaries has not reached a point at which the system threatens to break down by its own weight. In any case, there can be little doubt that any considerable expansion of dispensaries in the smaller communities must be based upon a system of remunerated medical services, and that such remuneration is necessary, both in justice to the medical profession and in order to have sufficient and efficient service in the clinics. One of the disadvantages of the present system in the dispensaries of Boston is the fact that almost all the clinics are held during working hours, so that wage-earners coming to the dispensaries lose time and money. So far as dispensary service is to be for the benefit of employed persons, it should include, in Boston and elsewhere in the Commonwealth, a reasonable proportion of clinics held in the late afternoon or evening.

TABLE I.

DISPENSARIES AND OUT-PATIENT DEPARTMENTS IN BOSTON.

| NAME OF INSTITUTION | TOTAL VISITS | TOTAL NEW PATIENTS |
|---|---|---|
| Berkeley Infirmary | 5,075 | 782 |
| Boston City Hospital (including Relief Stations) | 221,267 | 86,922 |
| Boston Dispensary | 118,918 | 24,505 |
| Boston Lying-in Hospital | 7,388 | 1,632 |
| Carney Hospital | 48,111 | 18,965 |
| Children's Hospital | 44,405 | 9,283 |
| Denison House | 4,848* | 1,616 |
| Dispensary for Women | 10,111 | 1,093 |
| Dorchester Relief Society | 1,000† | 300† |
| Forsyth Dental Infirmary | 29,186 | 17,060 |
| Jamaica Plain Dispensary | 1,326* | 442 |
| Lincoln House Association | 5,778* | 1,926 |
| Mass. Char. Eye and Ear Inf'm'y | 76,017 | 30,698 |
| Mass. General Hospital | 201,375 | 31,061 |
| Mass. Homeopathic Hospital | 44,094 | 12,745 |
| Maverick Dispensary | 8,301 | 2,052 |
| N. E. Hospital for Women and Children | 6,012* | 2,004 |
| Peter Bent Brigham Hospital | 36,523 | 8,536 |
| St. Elizabeth's Hospital | 8,713 | 2,936 |
| Salvation Army (Rescue Home) | 300* | 100 |
| Woman's Home Miss'y Society (Hull Street Dispensary) | 16,643 | 5,548 |
| TOTAL | 895,391 | 260,206 |

NOTE.—These figures do not include some small dispensaries and also omit the City Tuberculosis Dispensary. The number of "new patients" is not the same as the number of *different individuals* treated.

* In certain cases which are marked with an asterisk (*) the reports of the institutions as furnished to the State Board of Charity did not contain the number of visits and in certain other instances they did not contain the number of new patients. Where either figure was given the other has been estimated according to the rule that the number of visits is usually not less than three times the number of new patients.

† Estimated.

TABLE II.

DISPENSARIES AND OUT-PATIENT DEPARTMENTS OF HOSPITALS OUTSIDE OF BOSTON.

| NAME OF INSTITUTION | TOTAL VISITS | TOTAL NEW PATIENTS |
|---|---|---|
| Brockton Hospital Company, Brockton | 1,660 | 690 |
| Free Hosp. for Women, Brookline | 8,124 | 1,920 |
| Cambridge Hospital, Cambridge | 8,484 | 1,420 |
| Rufus S. Frost General Hospital, Chelsea | 1,658 | 999 |
| Clinton Hospital Association, Clinton | 1,344 | 448 |
| Framingham Hospital, Framingham | 236 | 135 |
| St. Anne's Hospital Corporation, Fall River | 1,758 | 586 |
| Union Hospital, Fall River | 30,529 | 3,998 |
| Addison Gilbert Hospital, Gloucester | 250 | 272 |
| Hale Hospital, Haverhill | 177 | 59 |
| Ladies' Union Charitable Soc. (Lawrence General Hosp.) | 5,157 | 1,719 |
| Lowell Corporation Hospital, Lowell | 17,856 | 4,716 |
| St. John's Hospital, Lowell | 5,645 | 1,766 |
| Ludlow Hospital Soc., Ludlow | 2,142 | 487 |
| Lynn Hospital, Lynn | 13,691* | 5,642* |
| Malden Hospital, Malden | 816 | 272 |
| Melrose Hospital, Melrose | 601 | 299 |
| Milford Hospital, Milford | 219 | 198 |
| Glover Home and Hospital, Needham | 20 | 20 |
| Anna Jacques Hospital, Newburyport | 626 | 374 |
| Cooley Dickinson Hospital, Northampton | 383 | 99 |
| Hillcrest Surgical, Pittsfield | 5,296 | 883 |
| Salem Hospital, Salem | 6,100 | 1,527 |
| Somerville Hospital, Somerville | 17,568 | 608 |
| Springfield Hospital, Springfield | 1,386 | 462 |
| Morton Hospital, Taunton | 100 | 56 |
| Waltham Hospital, Waltham | 404 | 433 |
| Noble Hospital, Westfield | 36 | 12 |
| Memorial Hospital, Worcester | 11,385 | 3,578 |
| TOTAL | 143,651 | 33,678 |

NOTE.—The tuberculosis dispensaries are not included.

* Same footnote as to Table I.

SUMMARY.

Twenty-three dispensaries in Boston treat 200,000 persons annually, or one-quarter of the population of the city. In all the remainder of the Commonwealth there are only about thirty dispensaries, receiving altogether only 50,000 to 60,000 patients a year. Facts gathered concerning certain groups of dispensary patients in Boston indicate that the bulk are from self-supporting families with incomes similar to those possessed by the majority of wage-earning families in general; and that these families, while able to meet their ordinary expenses, cannot provide for the emergency of sickness nor pay sufficient for the medical service which they require, to secure it at private physicians' rates. Delay in obtaining needed medical treatment after the onset of disease is frequent, especially in diseases which begin insidiously, even when they are serious. Protection to the wage-earner or his family by means of sickness insurance is infrequent. The present dispensary system, while providing greatly-needed treatment, both in general medicine and surgery and in the specialties, has the disadvantages of depending upon volunteer medical service, and of being usually inaccessible to wage-earners except during working hours.

## ON THE POSSIBLE NATURE OF MEASLES.

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CONCERNING the nature of the disease agents which give rise to the acute exanthemata, Von Jürgensen[1] said: "Since the methods which serve for the demonstration of pathogenic microbes fail us here, we are justified in concluding that we have to deal with something of a different nature. We have no ground, however, for assuming that this different 'something' is not a living organism, since every argument favorable to a belief in a *contagium vivum* as the cause of infectious diseases in general applies in full force to the acute exanthemata."

Many years ago Jenner[2] asked the question in regard to measles, scarlet fever, etc.: "May we not conceive that many contagious diseases, now prevalent among us, may owe their present appearance not to a simple but to a compound origin?"

In presenting an hypothesis that scarlet fever and the other acute exanthemata may be due to varieties of bacterial anaphylaxis depending on various well-known micro-organisms, I suggested in a recent communication[3] that the acute exanthemata may depend on something more than mere primary infections with bacteria. I believe that the evidence points to a streptococcic anaphylaxis as the "compound" cause of scarlet fever.

Measles, also, may be nothing more than the manifestation of an anaphylactic intoxication following sensitization with a well-known micro-organism. In spite of the fact that measles is the most prevalent and widespread disease to which human flesh is heir, its cause has not been explained by finding or assuming any simple microbic agent. Either the causal agent is one which is unrecognizable by our present methods of examination and diagnosis—a rather hopeless outlook—or the cause is so simple in its explanation that we have overlooked it.

It may be said that measles is, primarily, an acute respiratory disease. That the organism *par excellence* of acute respiratory disease is the pneumococcus will be admitted by most authorities. Is the pneumococcus guilty of being the prime cause of measles? Examine the records of our Army camps. Is it not suggestive that measles and pneumonia seem to closely coincide in number of cases, seasonal prevalence, mode of spread, communicability, etc.?

An account given by Duncan[4] of a recent epidemic of measles and pneumonia at Camp Wheeler is most interesting in this connection. In point of time the measles curve and pneumonia curve almost coincide. There were 701 cases of pneumonia and 2939 cases of measles. Of the 701 cases of pneumonia, 312 (44.51%) were preceded by measles, while 389 (55.49%) were not preceded by measles. 10.6% of the 2939 measles cases developed pneumonia. Duncan says that "the two diseases occurred in different parts of the camp at about one and the same time, showing thereby that a common factor present at the same time in different parts of the camp had to be considered." The pneumococcus as the etiological agent in both diseases would explain many of the facts brought out.

From the standpoint of general factors such as annual, seasonal and monthly incidence curves, it may be said that measles and pneumonia correspond. Sporadic cases of each dis-

ease exist in nearly every community, and each may take on epidemic proportions. So far as geographical distribution is concerned, it is known that both diseases are ubiquitous. In civil life as well as in Army life pneumonia is now looked upon as a highly communicable disease, for which isolation and disinfection are as important as in cases of measles.

Susceptibility to both diseases and virulence of the causal agents seem to vary considerably from time to time. Both diseases have as predisposing factors—crowding, poor ventilation, and the promiscuous spread of mouth and nose secretions.

Both measles and pneumonia are transmitted chiefly by direct contact, and the infectious agent of each has little vitality outside the body. Through the air zone of droplet infection due to coughing, sneezing, talking, laughing, etc., both diseases may be transmitted easily.

Before proceeding further it may be well to compare the symptoms and signs of measles with those of serum sickness, which is an admitted example of anaphylaxis. Following is an outline of the symptoms and signs common to these diseases.

TABLE I.

| CHARACTERISTICS | MEASLES | SERUM SICKNESS |
|---|---|---|
| Incubation period | 10 days (average) | 10 days (average) |
| General malaise | Present | Present |
| Fever | Present | Present |
| Eruption | First in mouth (Koplik spots). Spreads to skin of face and then over entire body. Has a variable appearance. Severe itching. | First around site of injection and then spreads over body. Has variable appearance. Often indistinguishable from measles rash. Severe itching. |
| Edema | Present | Present |
| Lymph adenitis | Present | Present |
| Albuminuria | Frequently present temporarily | Frequently present temporarily |
| Blood changes | Early leucocytosis and later leukopenia | Early leucocytosis and later leukopenia |
| Protection | One attack protects for variable period of time | One attack protects for variable period of time (antianaphylaxis) |

It is noticeable that in serum sickness there is little or no evidence of the various inflammatory lesions in the conjunctivae, nose, mouth, and throat, which are commonly found in measles. This may be interpreted by assuming that the possible anaphylaxis of measles is a natural one following the bacterial infection in the conjunctivae, nose, mouth and throat as portals of entry, while serum anaphylaxis is artificially produced with its chief local signs around the injection site. On the other hand, congestion of the conjunctivae and other membranes is frequently associated with serum disease.

There is nothing in the various experimental results obtained by many investigators which is incompatible with the above explanation of the nature of measles. The numerous instances in which the inoculation of filtered or unfiltered blood, or mouth or nose secretions, from cases of measles to apparently normal individuals (or to monkeys) have resulted in transmitting the disease, may be explained by assuming the passive transference of a hypersensitive state (passive anaphylaxis) through blood serum, or the active carriage of the micro-organism from one individual to another who has been previously sensitized.

About two years ago I carried on a brief investigation to test my original hypothesis as to the nature of measles. On account of other work, this investigation has been more or less interrupted until quite recently.

Realizing that the buccal mucous membrane is one of the earliest points of attack in measles, and that the characteristic lesions (Koplik spots) first appear on such membranes, it was decided to make a careful microscopic and cultural examination of these membranes in various stages of measles. Twenty-four sporadic cases occurring in the city of Boston were studied, and form the basis of this preliminary report.

Sterile glass slides, swabs, and tubes of media were used in each examination. The patient was placed in such a position and light that a good view of the buccal mucous membrane could be obtained. Using care not to touch the lips, tonsils, or other parts of the mouth except the insides of the cheeks, sterile swabs were rubbed with considerable force over the mucous membrane. For each case three different swabs were used. The first was inoculated onto Löffler's blood serum, the second into glucose broth with

a reaction of 0.3 to 0.5 acid to phenolphthalein, and the third was smeared over a sterile glass slide which was then fixed by heat. The cultures were incubated in an inside vest pocket until they could be placed in a laboratory incubator (usually within one-half hour). At the end of 24 hours, subcultures were made in various media, especially tall tubes of glucose agar (previously boiled to expel the air) and into tubes of ascitic fluid—kidney media with a layer of paraffin oil for the purpose of determining possible anaerobic organisms. Smears were stained by Gram's method and counterstained with safranin. No attempt was made to differentiate between types of pneumococcus.

As a result of these preliminary tests, it was found that all cultures showed the presence of pneumococci. Pneumococcus was grown in pure culture from fifteen. From the remaining nine cases pneumococci mixed with other pathogenic organisms such as staphylococci, streptococci, and mic. catarrhalis were cultivated. In the smears various mouth organisms were found, but in most cases the pneumococcus prevailed in largest numbers, especially within the phagocytic cells.

The predominance of the pneumococcus in many of the smears and cultures examined is certainly suggestive, and the additional finding of several pure cultures of pneumococcus adds strength to the opinion that the measles stomatitis in these cases was due chiefly to this organism. The fact that pneumococci may frequently be found in the mouths and saliva of apparently normal individuals prevents any positive deduction in this regard.

Of more importance than the prevalence of pneumococci in cultures from the buccal mucous membrane, is the finding in the smears examined of a very definite epithelial (endothelial) phagocytosis of pneumococci. If we are to give credence to our theories of positive chemotaxis, and believe that phagocytosis is an active defense of the body cells against attacks of bacteria, etc., we must assume that in the above instances the pneumococci were the invading hosts and that they were present in more than an incidental way. In these cases the evidence points to an active invasion of buccal mucous membranes by pneumococci, and an equally active defense on the part of the tissue cells against pneumococci.

In addition to verifying the above ideas and findings the writer is undertaking experiments to determine the possibility of using simple anaphylactic skin tests for the diagnosis of measles and scarlet fever.

The value of prophylactic streptococcus vaccines for the prevention of scarlet fever has been demonstrated by Gabritschewsky[5] and other Russian workers, as well as by Watters.[6] Along this same line, experiments are being attempted by the writer to determine the value of prophylactic injections of pneumococcus vaccine to prevent measles. In this connection, however, it must be kept constantly in mind that the process of desensitization, or of bringing about an anti-anaphylactic state, may in some cases first result in an actual anaphylactic condition with serious symptoms. In from ten to fifteen per cent. of persons who have been given the prophylactic streptococcus vaccine, a scarlatiniform eruption appears at the site of injection and often extends over the entire body. This may be associated with fever and all other symptoms of scarlet fever. Unless these are all coincidental cases of scarlet fever (an unwarranted assumption), it must be admitted that true scarlet fever in man may be thus artificially produced in a hypersusceptible individual, and it constitutes one of the strongest arguments for the theory that scarlet fever is the result of a streptococcic anaphylaxis.

It would seem advisable to use pneumococcus vaccines in the prevention of pneumococcic infections, and anaphylaxis, in both the Army and civil life. Military authorities are beginning to agree that vaccination with pneumococcus probably offers a better means of preventing the spread of pneumonia than does isolation of cases. It will most certainly be interesting to determine whether or not measles, also, may be decreased in its incidence in Army camps, following judicious prophylactic injections of pneumococcus vaccines.

That measles is nothing more than the manifestation of a pneumococcic anaphylaxis is worthy of consideration, as is also the suggestion that scarlet fever is dependent on a streptococcic anaphylaxis.

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## Book Reviews.

*The Pathology of Nephritis.* By WILLIAM OPHÜLS, California, Stanford University.

This monograph on the pathology of nephritis is illustrated by 32 consecutive cases and consists, primarily, of reports of these cases, pathologically grouped and discussed. Nephritis is classified on this basis into acute, subacute, subacute and chronic in children, and chronic. Only the glomerular form of the disease is considered. The author believes it due always to a bacterial infection, most commonly with members of the streptococcus family. The continuance of the disease is often due to a focal infection elsewhere. Edema, hypertension, and arterial stenosis are to be regarded as associated incidents or manifestations, due to the fortuitous action upon other tissues of the same cause, which injures the kidneys. The work is illustrated with 64 microscopic plates, and is a useful contribution to the pathology of nephritis.

*The Practical Medicine Series.* Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume II, General Surgery. Edited by JOHN B. MURPHY, A.M., M.D., LL.D., F. R. C. S. England (Hon.), F. A. C. S., Professor of Surgery in the Northwestern University; Attending Surgeon and Chief of Staff of Mercy Hospital, and Columbus Hospital; Consulting Surgeon to Cook County Hospital and Alexian Brothers Hospital, Chicago. Series 1916. Chicago: The Year Book Publishers.

This small (five by six) familiar volume is of course the final one edited by Dr. John B. Murphy. This fact alone increases the reader's interest and awakens recollections of the dead editor. Dr. Murphy has written a brief introduction of four pages: this corresponds to the conclusions which sometimes are, and always should be, placed at the end of a surgical monograph. In this volume they come at the beginning, and offer an excellent bird's eye view of the most important contributions to surgery during the previous year: a summary of progress, in fact.

It is quite impossible to review in detail this solid little book of 600 pages. It seems very complete, admirably condensed and satisfactorily illustrated. Accurate references to original papers are given under the head of each author who is quoted. The editor's comments, always brief and unequivocal, are enclosed in parentheses.

The book is an extremely satisfactory summary of recent surgical work. It is recommended to all surgeons, without reserve.

UNIVERSAL MILITARY EDUCATION. By LUCIEN HOWE, Fellow of the Royal Society of Medicine; Member of the Royal College of Surgeons. New York and London: The Knickerbocker Press.

This volume is a sequel to the author's "Brief for Military Education in Schools and Colleges," published last year. Its advocacy of universal military training is chiefly of interest from the medical standpoint, on account of its relation to physical education. The author advocates the adoption of the Swiss system, or some modification thereof, in the United States, and this monograph is an exposition of his reasons and arguments. Whatever the personal attitude of physicians on this subject, this book is commended to their reading, for the pertinence of its observations and comments.

*Aids to Bacteriology.* By C. G. MOOR, M.A. (Cantab.) F.I.C., and WILLIAM PARTRIDGE, F.I.C. Third Edition. New York: William Wood & Co.

The previous editions of this volume on bacteriology in the "Student's Aids Series" have been reviewed in the JOURNAL. This third edition, though it chronicles no notable discovery, represents a considerable extension and consolidation of previous knowledge on this subject. The conditions of military surgery in the European War have emphasized the important pathogenic possibilities of many anaerobic organisms. Meningitis as a disease of encamped troops has increased in importance, and the authors have extended their articles upon it and added an appendix. In another chapter is collected a summary of what is known about the filterable viruses, anaphylaxis and the preparation of vaccine. In discussing the anaerobic organisms mentioned, particular emphasis is given to the relative values of various antiseptics in sterilizing contaminated wounds. A few terminal chapters are devoted to the bacteriology of sewage, shell fish, meat, soil, air, milk and water, and to the more peaceful relations of bacteriology to agricultural methods in soil sterilizations, and in nitrogen fixation. The volume should continue its useful position in the series of manuals to which it belongs.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## INFECTIVE JAUNDICE AND WEIL'S DISEASE.

A CAREFUL gathering together of the various articles contributed by medical officers on toxic and infective jaundice and Weil's disease gives a very interesting study of the points of especial importance, and adds appreciably to our knowledge of the pathology of the liver. Of the three types, toxic jaundice, which has become familiar among munition workers, may be put aside for the moment. As for infective or spirochetal jaundice, there is an increasing tendency to differentiate it from Weil's disease. In some of the earlier reports, notably that by Stokes, Ryle and Tytler, which appeared in the *Lancet*, January 27, 1917, infective jaundice is regarded, both historically and clinically, as virtually the same disease as that described by Weil. Yet there seems to be a strong probability that the two diseases have clearly defined differences. On this point it is noteworthy that Weil himself has recently expressed a strong opinion (*Deutsche med. Wochenschrift*, 1916). He states that the cases observed by many writers are distinct from those which he has described.

Further information has only confirmed what he says as to the causes and symptoms of infective jaundice. On the Italian front, for example, Sampietro (*Annali d'igiene*, 1917) observed many cases which differed from Weil's disease in being relatively benign, in the absence of fever and albuminuria. Physicians, who before the war have seen cases of Weil's disease, will readily admit it is a serious form of icterus, with enlargement of the spleen and nephritis, or, as some writers like to add, with evidences of systemic infection. It rarely exists in an epidemic form, though many cases have occurred at one time in summer, in troops after swimming exercises and after eating fatty foods. According to Bäumler (*Muenchener med. Wochenschrift*, October 17, 1916) icterus is nearly always present as well as splenic enlargement, fever and nephritis. It has been known for some time that Weil's disease is peculiarly an affair of hot weather, youth, the male sex, food and swimming, all of which, according to Hecker and Otto (*Deutsches Archiv für klin. Med.*, 1892, p. 232) suggest an infection through the mucous membrane of the nose and throat and the alimentary tract.

So far as the German authors believe, Weil's disease is not caused by the Spirochaeta icterohemorrhagica of Ita and Inada, nor by the spirocheta of Hübener and Reiter (*Berliner klin. Wochenschrift*, 1916, p. 131). In fact, there is no evidence which seems to fit in with the theory that the infective agent of Weil's disease is a visible organism. This point is very clearly brought out in the most recent work on the differentiation of the two forms of jaundice. In the January issue of the *Journal of the Royal Army Medical Corps*, Colonel Martin, F.R.S., states that the distinction may be thus expressed: "In the spirochetal disease, in addition to hepatitis and jaundice, hemorrhages and an acute nephritis occur. It has a mortality of twenty to thirty per cent. and is apparently dependent upon man's association with rats for its propagation. The Gallipoli disease was much milder, was apparently more infectious, and there was no reason to suppose that rats contributed to its dissemination. Nevertheless striking analogies occur." In the cases of this jaundice, Colonel Martin adds, no blood parasites were found in films.

Another very uncertain factor in spirochetal disease appears to be the jaundice. On this point the best opinion is divided. According to Schott (*Muenchener med. Wochenschrift,* October 24, 1916) it occurs in nearly all cases. Martin and Pettit, on the other hand, observed it in only fifty per cent. of the cases in the French camps (*Bulletin de l'Académie de Médecin,* October 10th, 1916). The British, French and Italian authors generally agree with this opinion. It has been suggested, however, by Monti (*Bollettino della Societa medico-chirurgica di Pavia,* No. 4, 1916) that icterus may be a misleading symptom, as it may indicate the co-existence of catarrhal jaundice and the jaundice of paratyphoid infection. Hence some British writers believe that the term "icteric" is something of a misnomer, the two characteristic features being the hemorrhages and the spirochetosis. The distinction certainly has the merit of clearness.

Most authors accept the spirocheta described by the Japanese biologists Ita and Inada (*Journal of Tropical Medicine,* January, 1917) as the causal organism. The evidence is sufficiently strong, but some authors have failed to find it in their cases. Looking at this organism in its bearing on the different symptoms of the diseases, we may inquire how far other spirochetae may affect the question. Infective jaundice has several elements of uncertainty; in some cases the Spirocheta pallida has been found, and in still others a spirocheta isolated by Uhlenhuth and Fromme was the alleged cause. There seems in the present state of our knowledge no proof that there is a single organism at work. The appearance of the spirocheta of Ita and Inada is by no means invariable. It has been found in the kidneys of field rats, but not always (Nicolle and Blanc, Société de biologie, No. 9, 1917). Further researches seem to be necessary in this direction, as well as in the study of the specific immune bodies.

In saying this we are far from suggesting that Monti is right in his argument that infective jaundice is not an entity. The belief in a specific organism has amply justified itself by the facts of the case—the long period of incubation of three weeks, like syphilis, the sudden onset, the petechial hemorrhages, the lysis, and relative mildness of the disease. But it would be interesting to account for the cases of icterus gravis, acute yellow atrophy, and meningitis which have been noted as complications.

## INCIPIENT AND ADVANCED TUBERCULOSIS.

IT is no longer consonant with the advanced conception of the nature of pulmonary tuberculosis to differentiate incipient and advanced tuberculosis, nor to separate the disease off into stages for any purpose except in the most relative sense. This classification gives the patient a sense of security not warranted by the circumstances, or too gloomy a one, as the case may be. Neither in this disease nor, indeed, in any other is the line of demarcation between pathologic developments sharp enough for such determinations. In tuberculosis, particularly, is the time of the inception of the disease especially hard to discover, because so many recover from the infection before a diagnosis can be made. The discovery of the first palpable signs or symptoms of this disease may be long removed from the actual commencement of infection. Often the discovery of the pulmonary lesion is synchronous with the invasion of the general organism, that is, with the time when the ravages of the disease manifest themselves in disturbances of all the organs. To classify the progress of the disease in accordance with the amount of pulmonary involvement would be to ignore those cases with little or no physical signs because too deep in the tissues or not sufficiently circumscribed to manifest themselves to the senses, but where symptoms, and even sputum, may be positive. General miliary tuberculosis may have origin in a focus of infection not patent to the senses of an examiner. The size of an area of involvement is seldom an indication of the duration or of the severity of an infection. In susceptible individuals with little resisting power, any lesion denotes an advanced stage, no matter how recent the origin, if that could be determined. On the other hand, in resistant individuals, even a very large area may denote a very tractable condition, for the active part of the lesion may be a very small part of the whole, the rest being healed and scarred tissue. These large areas may have less systemic symptoms than very small but active lesions. Even in the matter of prognosis, a small lesion with systemic symptoms may be of graver import and actually more advanced than a very large lesion without symptoms. Within reasonable limits, the determination of the progress of the disease, as well as the outlook in pulmonary tuberculosis, is dependent largely upon the systemic symp-

toms rather than on physical signs. In all likelihood, subjects in whom the systemic manifestations are severe are the ones in whom the outlook is uncertain; and cases of so-called far-advanced tuberculosis that, nevertheless, come to cure are all the time really incipient in that healing and spread go on hand in hand, while at no time is the active disease area very profound, although much tissue had actually been involved. In fact, the disease is practically a local infection so far as the general organism is concerned. The organism can compensate for the destruction of a great deal of lung tissue without perceptible reduction of the air space.

The tendency to view tuberculosis with more gravity than heretofore, especially with respect to military service, has been enhanced by observation of the behavior of known tubercular cases in military life. There is little doubt that those cases of tuberculosis that were able to weather severe campaigns were cases in which the disease had practically always been local, no matter how large the area of involvement. In tuberculosis, if there is a line of demarcation between incipient and advanced involvement, the line hinges on the question of systemic participation in the disease. The terms "incipient" and "advanced," while in one sense unjustified, if they must be used, should be employed with these facts in mind, and as especially indicative of the effect of the disease upon the organism as a whole rather than upon the pulmonary tissues alone.

## THE SERUM TREATMENT OF PNEUMONIA.

IN discussing the reasons for the lack of marked success with the serum treatment of pneumonia, and perhaps even to a greater degree with the pneumococcus vaccine, it must be remembered that, while pneumonia is caused by the pneumococcus, there are many strains of this coccus which, although they are identical morphologically, are quite dissimilar in their behavior biologically. Any hope of success with serum or vaccine treatment must come from the employment of a serum from the actual type of the pneumococcus that causes the particular disease to be treated. Bacteriologists have succeeded in isolating four of the most numerous types, and they are designated as Types I, II, III, and IV. Types I and II are the most common. It is found in animal experimentation that serum produced with one type will not immunize against another type of pneumococcus, nor will immunity gained with one type protect against infection with another. This is, of course, true with the active treatment of pneumonia with the serum. For some reason, there has been even less success with vaccine prophylaxis and vaccine treatment in this disease, although some success has been reported with the prophylactic treatment. The prophylactic vaccine dosage is given of 600 million dead cocci at seven-day intervals for three injections, given under the skin. For the treatment of active cases, the introduction of so many bacteria into an organism already overcome with them rather lowers the resistance than increases it. In all likelihood, this can be explained on the ground that the negative phase induced immediately on the introduction of the killed cocci is too profound, and is not followed by the positive phase so necessary for successful vaccination therapy.

But any success gained through the serum treatment of pneumonia has been almost entirely with the use of sera produced from Type I organism, and because this type comprises the greatest number of infections, it is advised to use serum from this type where the exact type cannot be determined. The manufacture of other types of serum is being discontinued for stock use because of their slight application. The use of polyvalent immune horse serum made from the many types of the pneumococcus has proved to be almost valueless, because the benefits that arise with serum treatment seem to depend wholly upon the employment of the specific serum indicated in the particular case. Either the exact type of coccus must be determined in the laboratory, or a chance must be taken with Type I serum. Even though disease caused by other types of cocci is not benefited by Type I, it is perhaps advisable that all cases on admission be given Type I serum until the exact type is determined. It is not at all unlikely that most of the failures with the use of immune sera come from using serum made from a strain not causing the particular infection.

Moreover, with this lack of marked success with the use of serum must be remembered the usual dangers of serum treatments—that is, the danger of serious protein sensitization when so

much foreign protein is introduced into the body. However, even this danger may be somewhat anticipated by the intradermal skin test for serum sensitiveness—serum sickness. The raising of a wheal on the site of the injection is an indication of this anaphylactic sensitiveness to the injection of foreign protein. The serum dosage is rather large. About 100 cc. are given intravenously every eight hours for three or four doses until there is a decided drop in temperature. At best, the serum treatment is applicable only to a limited number of cases,—where the exact type of organism causing the infection can be determined, and where there is no great anaphylactic objection to the introduction of foreign protein.

## DEFINITION OF INFECTIVE STAGE OF VENEREAL DISEASE.

MANY requests are being received by the State Department of Health for an authoritative definition as to what is intended by the term "infective stage" of venereal disease, as used by this Department in the circular making these diseases reportable.

The term "no longer in an infective stage" is by no means a synonym of "cured." The syphilis patient who, for example, has had a few doses of arsphenamine may no longer be in an actively infectious state so far as the general public is concerned, yet he would be far from being cured. In order to give the practitioner something definite to go on, the following official interpretation of the term "infective stage" is offered for the purposes of reporting.

*Syphilis*—A patient suffering from syphilis shall be considered to be in an infective stage so long as he shows any symptom or lesion of primary or secondary syphilis, or any discharging lesion, of the tertiary stage.

*Gonorrhea*—A patient suffering from gonorrhea shall be considered to be in an infective stage until two negative laboratory tests have been obtained from specimens taken at least a week apart.

## GRAVE OF A FAMOUS BRITISH SURGEON.

THE *Lancet* has recently published the following photograph of the grave of Sir Victor Horsley at Amara, Mesopotamia, where the distinguished British surgeon died in service, July 16, 1916. The grave is in the British Cemetery, on the fringe of a palm grove, the mound, consisting of earth, baked and cracked by the sun. The picture was taken by a Sergeant of the Royal Army Medical Corps, attached to an Indian General Hospital.

## MEDICAL NOTES.

SMALLPOX IN NEW YORK CITY.—During the year 1917, there were fourteen cases of smallpox in the City of New York, eleven of them contracted out of town. One came from the South, eight from the West, one from Connecticut and one from up-state. Of the remaining three cases, one was closely associated with one of the preceding. The other two were in mother and son, and in these no definite connection with an earlier case of smallpox could be discovered. Six of the fourteen patients were Negroes.

During the past two months (January and February) five cases of smallpox have occurred in the City of New York. Two of these contracted the disease outside of New York City, one in Bristol, Pa., the other probably in Newark, N. J. A third case was traced to infection

by exposure to an earlier case. Four of the five cases were in Negroes.

While the total number of cases occurring in the city in the past few months is a little higher than usual, they need cause no uneasiness on the part of the public. Their occurrence calls attention to the fact that New York, as a center of industry, attracts large numbers of persons, some of whom bring infectious diseases into the city from distant points. These cases also show that the protection conferred by vaccination in childhood is of value for only a limited period. It should also be pointed out that a number of the smallpox cases which come in from outside sources or which develop in the city, travel about freely during the initial period of the disease, riding in public conveyances and otherwise coming in contact with large numbers of people.

MEDICAL ASPECTS OF THE TOBACCO HABIT.—In a paper read before the Association of Health Officers of Nova Scotia, (published in The Quarterly Bulletin of the Department of Public Health of Nova Scotia. Halifax, N. S., January, 1918) D. Fraser Harris, Professor of Physiology in Dalhousie University, gives an excellent résumé of the medical aspects of the tobacco habit. We believe that the following conclusions, presented by Professor Harris, will be approved by many physicians.

1. The substances in tobacco smoke which are injurious are probably oxidation products of nicotine and other alkaloids.
2. The smoking of tobacco is the more injurious the younger the person, hence young recruits suffer more readily from "tobacco heart" than older men.
3. The chewing of tobacco is much more injurious than the smoking of it, and ought to be discouraged.
4. Since what is injurious in tobacco smoke is absorbed more readily by inhaling than by smoking without inhaling, inhaling ought to be discouraged.
5. There is a marked idiosyncrasy towards tobacco in respect of the substances which raise the blood-pressure, cause irregularity of the heart and give rise to gastric acidity.
6. Those who have this idiosyncrasy ought not to use tobacco at all.
7. Those who do not have this idiosyncrasy may use tobacco in moderation with impunity.

TYPHUS IN IRELAND.—The *Lancet* quotes from the annual report of the Local Government Board for Ireland, just issued, which states that the cases of typhus notified during the year ended March 31st, 1917, numbered 110, or practically the same as the previous year, when the number was 112.

"These figures, however, do not fully disclose the incidence of the disease, because, as the report adds, notification has not been universally adopted in Ireland, and, further, because the initial cases in outbreaks of typhus are liable to escape recognition. In urban districts the disease was prevalent in Belfast, where 46 cases were notified; unfortunately the source from which the infection was conveyed was not ascertained. Twelve cases were reported as having occurred in Dublin, where the outbreak was attributed to overcrowding and insanitary conditions. In rural districts the largest outbreak (25 cases) occurred in Oughterard rural district, and this was also attributed to the same factors as in Dublin. Smaller outbreaks occurred in Tuam, Killadysert, and Enniscorthy rural districts. The steps taken to prevent the spread of the disease seem, in general, to have been more effective than the administrative action in regard to the grossly insanitary conditions and domestic overcrowding which admittedly were associated with its appearance."

## WAR NOTES.

PETROGRAD DECIMATED BY DISEASE.—It is reported that the population of Petrograd is being decimated by an outbreak of disease. The epidemic is attributed to extreme shortage of food and to all kinds of insanitary conditions. Various forms of typhus, as well as smallpox, are prevalent.

Moreover, extremely unsanitary conditions now prevail in the city, while all the organizations concerned with public health have either been abolished or have virtually ceased operations, owing to the revolution. There is no sanitary commission, there are no medical specialists, and there is no registration of diseases. Very few doctors are in practice and some of these threaten to go to Germany if the ignorant Russian proletariat doing menial work in the hospitals are permitted to continue to dictate to medical officers and trained nurses.

MEASLES IN ARMY CAMPS.—Measles epidemics are subsiding in both National Guard and National Army divisions, but pneumonia persists, according to the detailed health report for the week ending January 4, as made public by the Army Medical Corps. The tables show 109 deaths during the week in the National Guard,

80 due to pneumonia; and 167 in the National Army, 110 being due to pneumonia. The death totals for the previous week were 108 for the National Guard and 98 for the National Army.

DEATHS IN U. S. ARMY FOR WEEK OF MARCH 8.—Deaths among the troops in the United States regular army, National Guard and National Army, totalled 156 during the week ending March 8, an increase of 3 over the preceding week. Seventy-one of the deaths were from pneumonia.

The regular army had the highest total of deaths with 60, the National Army had 54, and the National Guard 42. The detailed report of the division of field sanitation, made public recently, says that the health of the troops continues satisfactory.

WAR RELIEF FUNDS.—On March 19, the totals of the principal New England War Relief Funds reached the following amounts:

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|---|---|
| Halifax Fund | $697,979.32 |
| Belgian Fund | 665,521.90 |
| French Wounded Fund | 330,379.85 |
| Syrian-Armenian Fund | 293,404.78 |
| Italian Fund | 152,668.40 |
| French Orphanage Fund | 152,598.86 |
| British Imperial Fund | 116,903.29 |
| Lafayette Fund | 34,594.28 |

AMERICAN TUBERCULOSIS REFUGE IN FRANCE.—Report from Paris on March 16, states that the American Red Cross in France has initiated a plan of caring for the repatriated French tuberculates who are returning daily to their homes from behind the German lines.

"A village community and a family colony for tubercular refugees will be created outside Paris on a site where a group of Quakers are clearing the land and constructing 150 three-room and five-room houses. Each house has a porch and can be taken apart and transported to the devastated regions when the war is over.

Dr. William C. White, head of the tuberculosis bureau of the Red Cross and originator of the plan, says the Red Cross has established tuberculosis hospitals for men and for women, but this involves separating husbands from wives and parents from children. This is the first experiment of a family colony for tuberculosis sufferers to be tried on a large scale.

The Department of the Seine has loaned 50 acres of meadow and woodland for the settlement and the Society of Friends has provided architects to lay out plans for the village and the houses. The French Government will pay more than half the cost of maintenance and the American Red Cross will expend a large sum."

AMERICAN WOMEN'S WAR HOSPITALS.—Report from New York on March 16 announces a plan of the War Service Committee of the Medical Women's National Association in behalf of the American Women's Hospitals to raise a large fund for the establishment and maintenance of hospital clinics in the Allied countries, to be staffed throughout by American women physicians, surgeons, and lay workers. The fund will be expended under the authority of the Red Cross. The raising of the fund will be in charge of Dr. Gertrude A. Walker, a trustee of the Women's Medical College of Penn., and of Dr. Rosalie Slaughter Morton, chairman of the American Women's Hospitals.

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending March 16, the number of deaths reported was 289, against 266 last year, with a rate of 19.21, against 15.19 last year. There were 49 deaths under one year of age, against 36 last year.

The number of cases of principal reportable diseases were: diphtheria, 68; scarlet fever, 24; measles, 255; whooping cough, 40; typhoid fever, 1; tuberculosis, 54.

Included in the above were the following cases of non-residents: diphtheria, 6; scarlet fever, 3; measles, 5; tuberculosis, 2.

Total deaths from these diseases were: diphtheria, 2; scarlet fever, 2; measles, 3; whooping cough, 2; tuberculosis, 15.

Included in the above were the following non-residents: diphtheria, 1; scarlet fever, 2; measles, 1; tuberculosis, 1.

## Obituary.

### JOHN GEORGE BLAKE, M.D.

DR. JOHN GEORGE BLAKE was born in the County of West Meath, Ireland, on August 8, 1837, and died at his residence in Beacon Street, Boston, March 4, 1918. He came to Boston on a sailing vessel with his mother and brother in 1849, and lived on Purchase Street, in the Fort Hill district. He attended school, and at odd times worked for a well-known druggist in that vicinity. Then and there began his wide knowledge of drugs, which was a characteristic in after years.

He entered the Harvard Medical School in 1858, and was fortunate in attracting the favorable notice of Drs. O. W. Holmes, J. Mason Warren, Henry J. Bigelow, and Edward H. Clarke. These gentlemen, appreciating the energy and struggles of the young man, requested him to attend the summer term at the school, free of charge.

On graduating from the Medical School in 1861 he received the appointment as house pupil at the Massachusetts General Hospital and served for a year under Drs. Warren, Bigelow, and doubtless other members of that famous staff. So long as he lived, Dr. Blake had a warm place in his heart for his *alma mater*, the Massachusetts General Hospital.

On leaving the hospital, he took an office on Harrison Avenue, a popular residential section of the South End, and was soon in active practice. Early in the Civil War, Dr. Blake was appointed recruiting officer, and when an emergency call came for surgeons, he joined the Boston unit, and saw service after the second battle at Bull Run.

From the early days of his professional life, Dr. Blake was interested in hospitals. He had more or less to do in the establishment of the Carney and St. Elizabeth's Hospitals and served upon the staffs. When the Boston City Hospital was opened in 1864, Dr. Blake, as one of the visiting physicians, made the first visit on the medical side with his house physician, Dr. Clarence J. Blake. His connection with the hospital continued without interruption until his death, nearly fifty-four years. He served as visiting physician until the formation of a Gynecological Department, when he was appointed senior physician for diseases of women, and, finally, senior physician, which position he held to the close of his life.

Dr. Blake was an accomplished clinician. He kept abreast of the times, was prompt and careful in his diagnosis, faithful in his supervision, cheerful and encouraging in his prognosis, a host in the sick-room. His visits were a ray of sunshine to his patients.

As a clinical teacher, Dr. Blake was deservedly popular; practical, resourceful, enterprising; ready to adopt new methods that promised to benefit his patients. He was especially interested in medical students. His own experience enabled him to appreciate their trials and their limitations, and he did much to help them, even after they had received their degree and started in practice. For many years it was his custom to employ recent graduates as assistants and, as a result, several physicians owe their favorable beginnings to his assistance.

Dr. Blake's private practice, both family and consulting, was extensive. His days and nights were fully occupied. His faculty for turning off work was remarkable. There were few idle moments. He once told the writer that, aside from his ordinary duties, he had attended five confinements in a single day. His capacity seemed to be limited only by the time in hand.

While carrying one of the largest practices in the city, he still found time for other activities. He served upon the Boston School Committee for sixteen years, much of the time as its chairman. He was also a water commissioner, director of the South End National Bank, and trustee of the Union Institution for Savings.

Dr. Blake was a member of the Massachusetts Medical Society, the Boston Society for Medical Improvement, and the Obstetrical Society. He was especially interested in the last-named society and was a constant attendant at its meetings for many years. Not a frequent writer for the medical journals, yet his papers were always interesting. He contributed papers to the History of the City Hospital, and also to various reports of that institution, issued from time to time. He was an independent Democrat in politics, and could be depended upon to support those measures which he thought would result in benefit to the people.

Dr. Blake's chief pastime was athletics, being especially fond of rowing. Many an hour was spent upon the Charles River with his sons and friends in that sport. He was also a constant attendant at the gymnasium of the Boston Athletic Club—a custom that undoubtedly conduced to his buoyant spirits his good health and long life.

In 1865 Dr. Blake married Miss Mary Elizabeth McGrath, who died eleven years ago. She was widely known as a writer for many years. He is survived by six of the eleven children: Miss Marie Blake, who has made a happy home for her father since her mother's death; the sons are Dr. John Bapst Blake, one of the surgeons-in-chief of the City Hospital; Dr. Gerald Blake, of the medical staff of the Massachusetts General Hospital; Arthur Blake, an ensign in the U. S. Navy; Robert Fulton Blake, of the Submarine Signal Company; and Frederick Blake.

Personally, Dr. Blake was cheerfulness personified. Genial, alert, enthusiastic, social in his instincts, he was naturally popular and had hosts of friends. He was fortunate in the possession of a peculiarly sunny temperament—a most desirable quality for any physician—that will always endear his memory to his many friends and patients. He served three generations of patients, an experience shared by few in any profession. He accomplished an enormous amount of good work, and won the respect and esteem of the community in which he passed his long life. His career is an encouraging example of achievement that is possible for those who have ambition, and the capacity and determination for continuous, faithful service in their chosen callings.

GEORGE W. GAY, M.D.

## Miscellany.

### NOTICE.

LABORATORY COURSE FOR WAR SERVICE, AMERICAN WOMEN'S HOSPITALS.—With the coöperation of the War Service Committee of the Medical Women's National Association, a second course in medical laboratory work is offered to applicants who have the preliminary training in science and scientific methods obtained in a four years' college course or its equivalent. The object is to fit workers for war service in medical laboratories in this country and in Europe, whether they take the place of men who have been called to the front, or go themselves as members of a unit which may be called for active service here or abroad.

Dr. William H. Park of the New York University and the City Health Department, Dr. Anna W. Williams of the Bureau of Laboratories of the New York City Board of Health, and Dr. Elise L'Esperance are in charge of the course, which will extend over a period of three months, requiring six hours' work each day. The training thus acquired should fit students to act not only as technicians, but as interpreters of the results obtained. The fee is $75.00.

The New York University and the Health Department have offered the use of their Laboratories, also Cornell Medical College.

Classes will be limited to about twenty (20). Work will begin at 9.30 a.m. on Monday, April 1, 1918, in the bacteriological department of the New York University, 1st Avenue and 26th Street.

Application may be made to Dr. Anna W. Williams, Research Laboratory, foot of East 16th St., New York City.

MICROBOLOGY.

I. General Microbology, including
   (1) The classification and general characteristics of pathogenic microörganisms (bacteria, molds, protozoa and microscopic worms).
   (2) General methods used in examining and cultivating microörganisms.
   (3) The relation of microörganisms to disease.

II. Specific Microbology, including
   (1) A study of all the more important pathogenic microbes, with special reference to microscopic diagnostic methods of these and of the infectious diseases in which no specific microbe has yet been found.

III. Microbology in Hygiene and Therapy, including
   (1) The examination of water, milk, air, soil, foods.
   (2) The use of disinfection.
   (3) The preparation and uses of serums and vaccines.

CLINICAL PATHOLOGY.

I. Chemistry and Microscopy—of the blood, gastric contents, feces, urine, spinal fluid, in health.

II. Chemistry and Microscopy—of the blood, gastric contents, feces, urine, spinal fluid and all exudates in disease.

### RECENT DEATHS.

EDWARD PAGE, M.D., formerly treasurer of the Massachusetts Dental Society for twenty-five years, and the last surviving member of the first dental class to graduate from Harvard University, died recently at the Home for Aged Men. Born in Groton, Dec. 4, 1826, the son of Abel and Asenath Page, he received his early education in the common schools of that town. He was graduated from the Harvard Medical and Dental Schools, was one of the organizers and first president of the Harvard Dental Alumni Association, and treasurer from 1874 to 1880. He became a member of the Massachusetts Dental Society in 1869, and served as its treasurer until 1897, when he was transferred to the honorary roll of that organization. He was also a member of the New England Dental Society and the Dental Protective Association of the United States.

RANSFORD DELOS CANEDY, M.D., one of the best-known practising physicians in northern Berkshire, died at his home in North Adams, March 10, 1918, of pneumonia. Dr. Canedy was 45 years old, and had spent his entire life in North Adams. He was a graduate of Drury School and of the College of Physicians and Surgeons at Columbia in 1896. Before beginning the practice of medicine he enjoyed considerable fame as a violinist of extraordinary attainments, and was frequently heard in concerts in North Adams. His rise in the medical profession was rapid, and he served several times as a member of the board of health, part of the time as chairman. Last fall he was appointed by Governor McCall as a member of the Exemption Board for District 1, the headquarters of which is North Adams. He also acted as examiner of the drafted men, and had spent most of his time on draft work for the past few months. He was a brother-in-law of the late W. Caldwell Plunkett of Adams, who died only a few weeks ago. He was, perhaps, one of the most popular physicians in this city and was possessed of a very attractive personality. He is survived by a widow and one daughter.

CHARLES H. GERRISH, D.M.D., for half a century a leading dentist of Exeter, N.H., died recently at the Carney Hospital, South Boston, at the age of 73 years. Dr. Gerrish was a foster son of the late Mr. and Mrs. Ira Burnham, who were long in charge of the academy dormitory, Abbott Hall, at Phillips Exeter. This was his boyhood home. Dr. Gerrish was captain of the team from the Exeter Gun Club, which won the first international clay pigeon tournament, held in Chicago in 1884. He leaves a wife and one daughter.

JOSE L. HIRSH, M.D., a noted specialist in children's diseases, died last week in Baltimore, of heart disease. Dr. Hirsh was born in Philadelphia in 1871.